Lacks 75 1-2 3

Elec. Period
Min. Lib.

THE ELECTRICAL WORLD

75022

A WEEKLY REVIEW OF CURRENT PROGRESS IN ELECTRICITY AND ITS PRACTICAL APPLICATIONS

VOLUME XXIX

FROM JANUARY 2 TO JUNE 26, 1897.

NEW YORK:

THE W. J. JOHNSTON COMPANY,

253 BROADWAY.

INDEX TO VOLUME XXIX.

GENERAL ALPHABETICAL INDEX.

NOTE.—*Entries from the Digest of Current Electrical Literature are indicated by D. (Digest) and D. R. (Digest Reference).*

*Illustrated articles are indicated by *.*

A

Accumulators
- Air, Huebener, (D.) 268
- Application as equalizers. By Illner, (D.) 850
- Blot, Criticism of. By Fitzgerald, (D.) 179
- Boese, Tests, (D.) 539
- Capacity, Relation of, to discharge current. By Penkert, (D.) 816
- Elevator operation, 704
- Engineering practice. By Appleton, (D.) 427, 510, 538, 564, 591, 625, 690, 814
- Guelcher, (D. R.) 179
  - Test of. By Penkert, (D.) 482
- High potential. By Zehnder, (D.) 209, 427
  - Howard University. By Trowbridge, 15
- Internal resistance of. By Haagn, (D.) 662
- Lead
  - Manganese compounds in. By Knorre, (D.) 426
  - Theory of action in. By Moore, (D.) 393; Liebenow, (D. R.) 482
- Material for. By Gruenwald, (D.) 28
- Monterd system, (D.) 511
- Motor vehicles. By Fitzgerald, (D.) 25
- N. Y. Accumulator and Electric Co., 515*
- Plates, Destruction of. By Zacharias, (D.) 28
- Rapid charging of. By Picon, (D.) 815
- Ribbe, (D.) 539; by Fitzgerald, (D.) 593
- Schanschieff, (D.) 268
- Soldering the electrodes of, (D.) 511
- Swiss. By Guye, (D. R.) 71
- 10,000 cells, Jefferson Physical Laboratory, (D.) 328
- Tudor, Rapid charging of, 418; by Blanchon, (D.) 511; Epstein, (D.) 565
- (See also Central Stations; Railways, Electric; Telegraphy.)

Acetylene
- Advantages of light. By Jacobus, (D.) 623
- Conductivity of solutions. By Jones, (D.) 72
- Poisonous action of, 355

Acetylene Light, Heat and Power Co., Niagara Falls, 733*
Advertising sign. By Clark, (D. R.) 693
Aging of transformer cores, 106
Agricultural machinery. (See Farming.)
Ahlm-Edwards Electric Co., Dynamos and motors, 269*, 333*
Air
- Dielectric constant of liquid. By Fleming and Dewar, (D.) 70, 267; (D. R.) 481
- Electrification of, by Rontgen rays. By Kelvin, Beattie, Smolan, (D.) 101; (D. R.) 209
- Magnetic permeability of liquid. By Fleming and Dewar, (D. R.) 71

Air accumulators, (D.) 268
Air compressor, Electric, Walker Co., 695*
Air-currents, Earth, Vertical. By Bauer, (D.) 661
Air pumps, Blake vertical twin, 149*
Air purifying apparatus, (D.) 692
Air-ship, The phantom, 496
Alcohol, Dielectric constant at low temperatures. By Dewar and Fleming, (D.) 510
Alcohol torch, Vallee, 297*
Alkalies
- Chlorine and alkalies. By Stoermer, (D.) 427
- Future of electrolytic. By Carpenter, (D.) 27
- Production of. By Kershaw, (D.) 294
- (See also Bleaching.)

Alkaline phosphates and caustics, (D.) 626
- Manufacture in Germany, (D.) 426

Alloys
- Carbon-zinc, Resistance of. By Haas, (D.) 327
- Production of metallic. By Walter, (D.) 482, 661

Alternating-current arcs. (See Arcs.)
Alternating-current curves, Apparatus for exhibiting. By Braun, (D.) 512
Alternating current machinery. By Dubsky, (D.) 563, 590; Houston and Kennelly, 20*, 94, 98, 166*, 234*, 285*, 354, 473, 526*, 621 686, 806
Alternating current problems
- New method of treating. By Breslauer, (D.), 100
- Sine curves, Use of. By Rhodes, 176, (D.), 100

Alternating current working. By Raymond, (D.) 659
Alternating-currents
- Development and laws of. By Houston & Kennelly, 20*
- Direct currents from. By Davis, 54*
- Distortion of waves. By Eisler and Reithoffer, (D.) 26, 71
- Frequency transformation. By Patten, 758*
- Polarization by. By Wien, (D.) 29
- Principles of. By Hay, (D. R.) 24, 481; Houston and Kennelly, 94
- Skin effect. By Taylor, (D.) 782
- (See also Currents.)

Alternators. (See Dynamos.)
Aluminum
- Blackmore process of production. By Kershaw, (D.) 851
- Copper plating, (D.) 28
- Electric conductivity of. By Richards and Thomson, (D.) 361
- Electro-coppering of. By Margot, (D.) 593
- Minet process, (D. R.) 539
- Production of. By Becker, (D.) ...; Kershaw, (D.) 241; Leeds, (D.) 393
- World's output, 768

Aluminum amalgam. By Biernacki, (D.) 295
Aluminum as a conductor for cables. By O'Gorman, (D.) 481
Aluminum patent decision, Bradley patents, (D.) 296, 330
Aluminum works at Foyers, (D.) 689
Amalgams, Magnetic. By Nagaoka, (D. R.) 241, 511
American Bell Telephone Co.
- Report, 1896, 442, 523, (D. R.) 594
- Vs .Western Union Telegraph Co., 496
- (See also Berliner Patent.)

American Electric Heating Co.
- Enamel rheostats, 399*
- Hatter's electric iron, 543*

American Institute Electrical Engineers
- Badge, New, 680*
- Meetings, 117, 613, 649

American Association for the Advancement of Science, 282, 580
American Street Railway, Niagara Falls convention, 613
Ammeters, Hot wire, (D. R.) 739
Ammonia
- Electrolysis of Salts and Bases in. By Losanitsch and Jovitschitsch, (D. R.) 28
- Formation of, from electrolysis of nitric acid, (D.) 426

Ampere standard. By Janet (D.) 72
Anchor Electric Co.
- Lamp socket, 33*
- New factory, 790*

Animal electricity. By Waller, (D. R.) 210
Annealing Harveyized armor plates. By Dougherty, (D.) 428
Antimony, Extraction of. By Jones, (D.) 144
Arc lamp globes, Loss in soiled. By Hesketh, (D.) 814
Arc lamp hanger, Johns, 742*
Arc lamps. By Richard, (D.) 537
- Alternating current, Puritan, 36*
- Aron, with cadmium amalgam, (D.) 849
- Branson system for lantern, (D.) 563
- Constant potential, Making of. By Poole, (D.) 25
- Enclosed
  - Discussion of. By Hunter, 291; Marks, 130*, 174*, 198
  - High potential. By Marks, 174*
  - Nowotny long burning, 631*
  - Progress of. By Marks, 712*, 837
  - Single solenoid, 740*
  - Upton Midget, 787*
- Faults in, (D.) 453, (D. R.) 325
- Foreign, (D. R.) 424
- Hansen, For small currents, (D. R.) 509
- Hefner, (D. R.) 72
  - Influence of atmosphere. By Boistel, (D. R.) 268; Liebenthal, (D. R.) 29
- Hepworth, Description of, (D.) 689
- Jandus, Tests of. By Pierron, (D.) 424
- Paragon long-burning, 483*, 629*
- Pentane, Influence of atmosphere. By Boistel, (D. R.) 268; Liebenthal, (D. R.) 29
- Puritan, 36, 105*
- Shunts for, (D.) 25
- Small, Advantages of, (D.) 689
- Street lighting by. By Hesketh, (D.) 563
- 220-volt, Great Britain, (D.) 850
- Unique long life, 693*
- Upton Midget, 363*
- Walker, 664*

Arc lighting
- America and Europe. By Wiler, (D.) 623
- Recent progress. By Thomson, 762, (D. R.) 99
- Three lamps on 110 volt circuit, (D) 265

Arc lights, Coloring, (D) 780
Arcs
- Curious freak of, (D.) 453
- Luminous efficiency. By Blondel, 223, 232*, 258*, (D.) 479; Ayrton, (D) 657
- Mercury. By Arons, (D.) 99
- Resistance of. By Frith and Rodgers, (D. R) 207
- Temperature of, 68. By Guillaume, (D) 426; Wilson and Fitzgerald, (D) 144
- Voltaic, (D.) 424
- Whistling. By Bain, (D.) 360

Armature disc-cutter, Bliss, 487*
Armatures
- Balancing. By Baxter, (D.) 239
- Care of. By Baxter, (D) 99
- Dead wire on. By Anthony, (D) 325; Pfund, (D.) 292, 509
- Faults, Method of determining, (D.) 24
- Heating of. By Moffat, (D) 735
- Insulation of. By Illmer, (D) 563
- Iron losses in teeth, Calculation. By Breslauer, (D) 325, 537
- Reaction in, (D.) 265. By Hawkins, (D) 623, 657, 689, 780, 813, 849; Kando, (D.) 24, 325; Rothert, (D.) 99, 177; Vogelsang, (D.) 177
- Effect on characterictics of dynamos. By Stine, (D.) 657
- Foucault currents. By Westphal, (D.) 453; Besao, (D.) 590
- Winding. By Baxter, (D. R.) 239; Harris (D.) 142, ...7
  - Barrel method, Improved 540*
  - Diagram. By Doane, (D.) 834*

Armor plates, Annealing Harveyized. By Dougherty, (D.) 428
Armory, Electric lighting of, 451*
Asbestos as insulating material, 458
Atmosphere electrically measured. By McTighe, (D.) 330
Atmospheric electricity in high regions. By Le Cadit, (D.) 660
Atomic weights of silver, mercury, etc., Determining. By Hardin, (D.) 456
Atoms
- Dissociation of. By Fitzgerald, (D.) 737
- Electric and magnet forces of. By Richcarz, (D.) 737

Attachment plug for incandescent lighting, 339*
Autographic recording meter. By Hering, 617*

B

Baggage transportation, Overhead, at station, (D.) 736
Bailey switchboard, 786*
Baillard Roentgen ray apparatus, 73*
Balance, Du Bois. By Ebeling and Schmidt, (D.) 145, 566
Ball medium speed engine, 299*
Balloon, Static charge of, (D.) 457
Barney & Smith Car Co., Electric cars, 331*
Batteries
- Acetate standard cell. By Mauri, (D.) 626, 662
- Cadmium cell. By Jaeger and Wachsmuth, (D) 29; (D. R.) 268, 566
- Carbons. By Lommasi, 89
- Haemoglobin. By Case, (D.) 394, 427
- Reactions in. By Liebenow and Strasser, (D.) 362
- Carnot principle applied to the theory of the cell. By Raveau, (D.) 662
- Clarke, Variations in E. M. F. with temperature. By Ayrton and Cooper, (D. R.) 101
- Colley cell, Experiment. By Descondres, (D.) 783
- Creeping salts in, (D.) 738
- Cyanides for. By Platner, (D.) 426
- Dry, Bunnell, 396
- Efficiency of an electrolytic. By Hurter, (D.) 209
- Gravity, Gethius, 667*
- Haemoglobin cell, (D.), 394, 427
- Heat transforming. Essick, 486*; (D.) 593
- Iron chloride. By Knester, (D.) 511; Pauling, (D.) 328; Rammelsberg, (D.) 783.
- Jacques, By Anthony (D.) 71
  - Expiring patent on. By Reed, 141
  - Notes on, 4
  - Theories. By Reed, 13

Batteries
Liquid for, (D.) 28
Polarization in. By Ihle, (D.) 71
Primary
New and novel, 378
Sicard and Faile, (D.) 71
Traction purposes. By Peddie, (D.) 100
Standard cells. By Mauri, (D.) 626, 662
Thermo-electric. By Anthony, (D.) 852; Reed, (D.) 565
Voltaic, Arc thermo-electric. By Asher, (D.) 328
Battery carbons, Contracts for, (D. R.) 28
Becquerel rays, (D.) 149, 455, 510
Beer, Fining, by means of electric light, (D.) 102
Beet root juice, Purification, Schollmayer process, (D. R.) 145
Belknap Motor Co., Voltage regulator, 395*
Bells without iron, (D.) 784
Berlin exhibition, (D. R.) 30
Berliner patent. By Dunbar, 18*, 52; Frost, 281, 497; Judge Taylor, 842
Decision
Bell Co.'s favor, 607, 609, 611
Opinions of manufacturers, 611, 650
Probable. By Frost, 497
Text of, 651
History of the patent, 610*
Patent Office records, 160, 169*, 176
Patent specifications, (D. R.) 784
Validity of patent. By Sutton, 716*
Besley diehead, 74*
Bicycle exhibition, New York, 262
Bicycle factory, Three phase power plant, 243*
Bicycle lamps, Electric cycle show, New York, 299*
Star, 337*
Bismuth
Refining. By Zakorski, (D.) 393
Resistivity of. By Dewar and Fleming, (D.) 426; (D. R.) 482
Black light. By Perrigot, (D. R.) 738
Black rays, New kind. By Friedrich, (D. R.) 426, (D.) 691
Blake marine air pump, 149*
Bleaching
Alkalines, Austrian patents. By Kellner, (D. R.) 241, 268
Cotton. By Vogelsang, (D.) 456
Electrical method, (D. R.) 29; By Blount, (D.) 27; Saget, (D.) 101
Electrolytic solutions, (D.) 145
Kellner process, (D.) 71, 427
Bliss, E. W. & Co.
Armature disc-cutter, 487*
Punching press, 216*
Block signaling. By Boult, (D.) 101, 180, (D. R.) 242; Pigg, (D. R.) 29
North London Ry. By Ferreira, (D.) 692
Blow pipe furnace. By Patten, (D.) 483
Boat, Submarine, Holland, (D.) 690
Boiler-feeding pump, Electric, 431*
Boiler scale and electricity, (D.) 428
Boilers
Efficiency, in central stations, 754
Watertube safety, Philadelphia, 330*
Book reviews
A B C of the X-Rays. W. H. Meadowcroft, 181
Auto-cars, cars, tram cars, and small cars. D. Farman, 627
Commercial Organization of Factories. J. S. Lewis, 242
Electric Telegraphy. Houston and Kennelly, 540
Electric transmission of power. Dr. Louis Bell, 211
Electrical Telephone. E. J. Houston and A. E. Kennelly, 428
Electricity and Magnetism. By Eric Gerard, 566
Methode di Misura delle Grandezze Elettriche. Riccardo Arno, 627
National Electrical Code. Pierce & Richardson, 180
Power Distribution for Electric Railroads. Louis Bell, 296
Standard Wiring. H. C. Cushing, Jr., 627
Submarine Telegraph Cables. Charles Bright, 428
Theory and Calculation of Alternating Current Phenomena. C. P. Steinmetz, 145
Tutorial Chemistry. G. H. Bailey, 242
Tutorial Statistics. William Briggs, 242
Universal Electrical Directory, 627
Wirkungsweise, Berechnung und Koustruction Elektrischer Gleichstrom-Maschinen. J. Fischer-Hinnen, 211
Booster, Induction motor as. By Davis, 390
Bourgogne canal, Electric traction on. By Dupuy, (D.) 266, (D. R) 326; Robinson, (D.) 624, 658
Brake for testing small motors. By Marechal, (D.) 657
Brakes. (See Car brake.)
Breaking large currents by tuning fork. By Webster, (D.) 594
Brett, Jacob, Death, (D. R.) 180
Brill Co., J. G., plant, 37
British Association for the Advancement of Science, Toronto meeting, 168
Brooklyn Bridge
Electric power plant, 119*
Through trains, Report of Commission, 223, 230*, 376
Transportation system, 354, (D. R.) 207
Trolley cars on, 676, 680
Brunt & Thompson lamp socket, 149*
Brush, Carbon, How to make. By Coleman, (D.) 563
Brush Electric Co., Apparatus near Niagara Falls, 740
Bryant Electric Co.
Bug cutout, 297*
Porcelain lamp base, 397*
Rosette, 72*
Bubier dynamo, 397*
Buffalo celebration of Niagara power transmission, 83, 85, 103*
Bulkley injector condenser, 818*
Bullets, Deflection by electric currents, (D.) 512
Bullock Electric Mfg. Co., Changes, 334
Bunnell & Co.
Dry batteries, 396
Wire stretching device, 543*
Burglarizing safes, (D.) 210; By Summers, (D.) 817
Bushing, Porcelain, Robinson, 567*
Business world, January, 1897, 38

C

C. & C. Electric Co.
Boat motor, 334*
Ironclad motor, 540*
Cabinet, Cashier's electric safety, 597*
Cable railways
Financial results compared with electric railways, (D.) 625
New York
Dead man's curve, 317*
Runaways, 828
Third avenue extension, 37
Cable steamer Portena, (D. R.) 512
Cable testing. By Hale, 441*
Measuring the earth current. By Schoenau, (D.) 179
Cable testing sets
Nalder, (D. R.) 242
Willyoung portable, 34*
Cables
Aluminum as a conductor for. By O'Gorman, (D.) 481
Carrying capacity of, (D.) 481
Drying air cables. By Petsch, (D.) 591
Induction in multiple core. By Preece (D. R.) 29
Manufacture. By Reed, (D. R.) 100
Machinery, (D. R.) 144, 427
Street railway, Measurement of the insulation resistance. By Uppenborn, (D. R.) 29
Waterproof, non-fibrous, (D.) 455
(See also Submarine Cables.)
Cables in a tank, Determining the relative positions of. By Taylor, (D.) 692
Cadmium, Atomic weight of. By Hardin, (D. R.) 662
Cadmium standard cell. By Jaeger and Wachsmuth, (D.) 29, (D. R.) 268
Calcium carbide, (D.) 626
As a reducing agent. By Warren, (D.) 179
Manufacture of, 733*
Plant near Geneva. By Guye, (D.) 738
Calculator, Smith-Manifold. By Low, (D. R.) 428, 540, 693
Calibrating measuring instruments for alternating currents. By Wilkins, (D.) 739
Canadian Electrical Association, Convention at Niagara, 618, 717
Canal, Bourgogne, Electric traction on. By Dupuy, (D.) 266, (D. R.) 326; Robinson, (D.) 624, 658
Capillary experiment, Electro. By Chassy, (D.) 392
Car brakes, Electric. By Baylor, (D.) 591
Bonta, (D.) 25
Pneumatic, Chapsal system, (D.) 29
Steep grades at Havre, (D.) 142
Car fares in Indianapolis. Legal decision, 552, 761, 800, 808
Car lighting, Electric
At., To. & S. Fe Ry., (D. R.) 736
Austria, Boese accumulators, (D.) 424
Dynamo on axle, 630*
England, 439, (D. R.) 25
Car motors. (See Motors, Railway.)
Car wheels
Hardening of, (D.) 513
Increasing adhesion by magnetism. By Meyer, (D.) 781
Carbide industry in Germany. By Frank, (D.) 663
Carbide of iron, Preparation of. By Moissan, (D.) 661
Carbon
Crystallization of. By Borchers, (D.) 511
Direct union with hydrogen. By Bone and Jordan, (D.) 738
Electric deposition of, (D.) 72
Electro-chemical equivalent of. By Cohen, (D.) 661
Oxidation without heat. By Case, (D.) 852
Reaction of, in electrolysis. By Vogel, (D.) 692
Transition from non-conducting to conducting state. By Brion, (D.) 69, 267
Carbon filaments. (See Incandescent lamp filaments.)
Carbon in flames, Electrical action of. By Fuge, (D.) 659
Carbon-zinc alloys, Resistance of. By Haas, (D.) 327
Carbonizing lamp filaments. By Krueger, (D.) 457
Carbons
Arc lamp, Guides for, (D.) 814
Battery, Contracts for, (D. R.) 28
Electrolytic purposes. By Lessing (D.) 241, (D. R.) 295; Krupka and Jacoby, (D.) 851
Carborundum Production and use of, (D.) 145; by Fitzgerald, (D.) 241
Carborundum Co., Niagara Falls, 731*
Card elevator controllers, 744*
Cars
Barney & Smith electric, 331*
Double-deck, centre vestibule, 298*
Dynamometer, (D. R.) 207
Current consumption under various potentials. By Chapman, (D.) 292
Instrument, of the Munich station. By Upperborn, (D.) 266
Repairing electric. By O'Mahony, (D. R.) 782
Cashier's electric safety cabinet, 597*
Cast copper, Tests of. By Brown, (D.) 329
Cathode rays. By Elster and Geitel (D.) 481; Fitzgerald, (D.) 815; McClelland, (D.) 691; Oudin and Corda, (D.) 267, 294; Thompson, (D.) 144; Thomson, (D.) 691, 737; Swinton, (D.) 455
Alternating magnetic field. By Fleming, (D.) 592
Coloring salts with. By Goldstein, (D. R.) 660
Deflection of. By Barr and Phillips, 289; Majorana, (D.) 737
Deflection by magnetic field, 97*; (D.) by Barr and Phillips, (D.) 144, 327
Diamonds, Action on. By Moissan, (D.) 565
Effect of magnetic field on rays. By Birkeland, (D.) 815
Electric or magnetic field, In an. By Garbasso, (D. R.) 267
Electrostatic bending of. By Jaumann, (D.) 539
Experiments by Lord Kelvin, 523, 528*
Jaumann's theory. By Poincare, (D. R.) 426
Longitudinal tension. By Colard, (D.) 101
Mathematical theory. By Garbasso, (D.) 100
Mutual action of electrodes and cathode rays. By Deslandres, (D.) 565
New property of. By Deslandres, (D.) 737; Goldstein, (D. R.) 361
Photo-electric action of. By Elster and Geitel, (D.) 327
Residual photo-electric effect of. By Elster and Geitel, (D. R.) 71
(See also Roentgen rays.)
Cautery transformer, 367*
Cedar poles for electrical uses, Sterling & Son, 74*
Ceiling motor, Ahlm-Edwards, 333*
Cells. (See Batteries.)
Cement, Electric conductivity, (D. R.) 266
Central Electric and Foundry Co., Generators, 485*
Central station diagrams, (D.) 143
Central stations
Accumulators
Boston Edison Co., (D.) 591
Bowling Green, New York City, (D.) 392
Brooklyn, (D. R.) 510
General practice. By Appleton, (D.) 427, 510, 538, 564, 591, 625, 659, 690, 814
Hartford Electric Light Co., 255*; (D.) 178
Various systems and advantages. By Schoop, (D.) 360, (D. R.) 510
(See also Accumulators; Railways, Electric.)
Alternating current
Detroit, (D.) 292
Profitable day load. By Hanchett, 525, 589
Alternating vs. direct current stations, (D.) 851
Arc circuit troubles, (D.) 178
Bakersfield, Cal., (D.) 690
Belgium, Co-operative plant. By Schoentjes, (D. R.) 591
Bellegrade. By Preller, (D.) 814
Birkenhead, Eng., (D.) 178
Blackburn, (D.) 625
Bolton, Eng., Municipal plant, 108*
Bradford, Eng., High voltage. By Gibbings, (D.) 293
Brighton, Eng. By Bathurst, (D.) 851
Brooklyn
Accumulators, (D. R.) 510
Edison, (D.) 70
Municipal Electric Light Co., 679*
Brussels. By Travailleur, (D.) 850
Budapest, Alternating current. By Moutier, (D. R.) 208
Chalfont, Petroleum engines used, (D.) 70
Charlestown, Test, (D.) 70
Chester, England, (D.) 70, 240
Chicago, West Side Park, (D. R.) 480
Chicago City Railway, (D.) 292, 782, (D. R.) 361
Cologne
Data table, (D. R.) 70
Report of operation, (D.) 178
Combined lighting and traction. By Spence, (D.) 69, 591
Combined pumping and lighting. By Sykes, (D.) 814
Conductors, Individual. By Crocker, 93*
Continuous current, Switzerland. By Hecht, (D.) 590
Costs
Construction and operation. By Bell, (D.) 850
Edison plant, (D. R.) 361
Great Britain, (D. R.) 26
Lighting from public and private supply. By Warden-Stevens, (D.) 177
Croydon, (D. R.) 70
Daylight work. By Martin, 753
Deptford, Lond., High-voltage, (D. R.) 100
Design and construction of. By Arnold, (D.) 480, 510, 591; Lardner, (D.) 480
Development of. By Insull, (D. R.) 100
Dorchester, (D.) 454
Dresden, Three-phase, (D. R.) 100
Duesseldorf, Cost of operation, (D. R.) 26
Edison Illuminating Co. of New York, (D. R.) 782
Elizabeth, N. J. By Roller, (D.) 850
Europe, Statistics, (D.) 659
Feeder regulation. By Crocker, 125*
Ft. William, (D.) 564
France, Statistics, (D. R.) 266
Gas engines in, (D.) 360; By Perry, (D.) 690; Richart, (D. R.) 735
Coatbridge station, (D.) 659
Midland Ry. Co. By Langdon, (D.) 735
Gas plants compared with central stations. By Seamon, (D.) 361
Georgetown. By Hopkins, (D.) 591

Central stations
Great Britain, Data tables, (D. R.) 100, 144
Hamburg, Report, (D. R.) 454
Harrow, Description, (D.) 690
Hartford. By Robb, 227*, 255*, (D.) 178
High vs. slow speed machinery, (D.) 392
High-voltage plants. By Addenbrooke, 94, (D. R.) 177
Bradford, Eng. By Gibbings, (D.) 293, 326
Great Britain, (D.) 850; By Addenbrooke, (D.) 569
Walsall station, London. By Wyllie, (D.) 510
Kensington Court, Lond., Low-tension, (D. R.) 100
Lachine Rapids, (D. R.) 292
Lamp connection diagrams, (D.) 100
Lamp economy, (D.) 25; By Bussmann, (D.) 292; Gusinde, (D.) 99; Hancock, (D. R.) 70; Riggert, (D.) 142
Free supply. By Gibbings, (D.) 143
Incandescent lamps. By Terry, 172
Launceston, Tasmania, (D). 100, (D. R.) 144
Lausanne. By Blondin, (D.) 25
Leipzig, Report on operation, (D. R.) 690
Lincoln Park, Chicago, (D. R.) 70
Loads
Profitable day loads. By Wilmerding, 714
Profitable, in alternate current systems. By Hanchett, 525, 589
London, Financial results, (D.) 240
Losses in. By Herrick, (D.) 814
Lucerne. By Guinand, (D.) 454
Manchester, Operating data, (D. R.) 782
Melbourne, Aus. By King, 5*
Mexico, at Piedras Negeas, (D. R.) 454
Middlesex, Vt., (D. R.) 735
Montreal, Alternating current. By Gossler, (D. R.) 538
Munich. By Uppenborn, (D.) 178
Municipal control. By Francisco, 703, 707; Thayer, (D.) 454; Winchester, (D.) 361
Bolton, Eng., 108
Municipal Electric Light Co., Brooklyn, 679*
Newark, N. J., Quick work in re-establishing, 97, (D.) 326
Niagara. Cataract Construction Co., 311*
Nice, (D. R.) 70
Norwich, Eng., 471*
Operation of. By Tandy, (D. R.) 70
Diagrams illustrating, (D.) 143
Paterson, Edison station, (D. R.) 240
Pawtucket plant (D.) 25
Philadelphia Traction Co., Destruction of, 348, 356*, 683
Providence, R. I. By Wetzler, (D.) 510
Rating of. By Aldrich, (D.) 781
Rheinfelden. By Routin, (D.) 814
Romagnano. By Nizzola, (D.) 814
Rome, (D.) 659
Rouen, France. By Laffargue, (D.) 851
Rumburg, Three-wire system and accumulators, (D. R.) 782
St. Anthony Falls, (D. R.) 781
St. Helens, Small plant, (D.) 178
St. Pancras, Reports on operation, (D.) R.) 690, 782
Selection of. By Wagner, (D. R.) 207
Small, France, (D.) 208
Small towns and, (D.) 208
Springfield, Mass., (D.) 814
Steel work in a modern power house. By Jones, (D. R.) 538
Strassburg. By Saint Gilles, (D.) 814
Telluride plant. By Blainey, (D. R.) 781
Three-wire systems. By Crocker, 126, 167, 197
Tivoli-Rome plant, (D. R.) 624
Toledo, Ohio, (D. R.) 100
Water power electric plants in the U. S. By Washington, Jr., 311*
(See also Isolated plants; Railways, Electric; Transmission plants.)
Central stations vs. isolated plants, (D.) 208
Central Union Telephone Co., Chic., Report, (D. R.) 296
Chapman receptacle, 543*
Charging for electrical energy, 408; By Hale 478; Wilson, (D.) 425, 454; Wright, 751, 757, (D.) 266, 293
Brighton, Eng. By Wright, (D.) 564
Competition of private installations, (D.) 814
Germany. By Kallmann, (D.) 625
Charging machines, Wellmann. By Head, (D.) 692
Chemical and metallurgical industries, Electricity in. By Kershaw, (D.) 71, 241, 267, 268, 294, 328, 393, 456, 511
Chemical synthesis by means of the dark electric discharge. By Lasonitsch and Joritschitsch, (D. R.) 662
Chemistry, Roentgen rays. By Von Hemptinne, (D.) 737
Chicago cycle show, Electric plant. By Kimbark, (D.) 240
Chlorates, Production of. By Oettel, (D.) 209
Chloride of bromium, Dissolving gold in. By Gaze, (D.) 27
Chlorine
Effect of ultra violet light on. By Wild and Harker, (D.) 455
Production of. By Hargreaves, (D.) 661; Kershaw, (D.) 294
Chlorine and alkalies, Kellner process, (D.) 71
Chlorine and sulphur, Electrolytic researches with. By Gross, (D.) 427
Chlorine and zinc, Manufacture of from blende, Hyte system, (D.) 27
Chuck, magnetic, (D.) 594
Circuit-breaker indicator, (D.) 178
Circuit breakers, (D. R.) 208; By Wurts, (D.) 450
Automatic, for small currents, 628*
Automatic interruption for induction coils. By Sayen and Willyoung, (D.) 362
Circuit breakers
Improved form, Automatic, 484*
Leonard automatic, 397*
Mercury, for induction coils. By Londe, (D.) 394
Railway circuits. By Mountain, (D.) 326
Tests in New York, 756
Volta system, (D.) 782
Circuits
Alternating current. By Manchett, (D.) 326, 455
Broken, Principles of inductance, (D.) 179
Calculation of. By Perrine, (D.) 293, 592
Oscillatory discharges in derived circuits. By Magri, (D.) 592
Safety devices for, 192; By Perrine, 161; Stine, 138
(See also Wiring.)
Clamp, Johns toggle-clamp insulator, 485*
Clayton & Lambert torches, 339*
Clocks
Automatic switch for lights and meters, (D.) 690
Electric, in Krupp Works. By West, (D. R.) 427
Cloos feeder junction box, 181*
Clutch, Electric, Brancher and Vinnot system, (D. R.) 454
Clymer & Heilman motors, 338*
Coal
Electricity from. By Case, (D. R.) 101
Tested with Roentgen rays, (D.) 691
Coal and ash handling plant, Jeffrey Mfg. Co., 35*
Coal-mining machine, Jeffrey electric, (D.) 590
Coal pockets equipped with thermostats, 147
Coast defense, Electric light for. By Boyd (D.) 265
Cochrane high-pressure steam separator, 484*
Coils
Equalizing, for three-wire system. By Girault, (D.) 813
Formulas for calculating coils. By Gray, (D.) 593
Heating of magnet. By Carhart, 11
Magnetic fields of. By Everett, (D.) 144
(See also Induction coils.)
Collisions at sea, Method of avoiding, (D.) 627
Coloring matters, Production by electrolysis, (D.) 144
Columbia Incandescent Lamp Co., Lamps, 486*
Commercial Electrical Supply Co., St Louis, 148*
Commutators
Care of. By Poole, (D.) 24
Troubles and their remedy. By Hutchings, (D. R.) 207; McClellan, (D.) 657
Trueing of. By Lynch, (D.) 24
Compressed air in railway work. By Aldrich, (D.) 25
Compressed air vs. electric traction, 440, 443*
Concrete, Electric conductivity, (D. R.) 266
Condensers. By Armagnat, (D. R.) 72; Finn, (D.) 428
Bulkley injector, 818*
Impedence law of condenser discharge. By Petrovitch, (D.) 455
Making, Tesla system, (D.) 329
Oscillating discharge of. By Busch, (D.) 660; Tallqvist, (D.) 592
Residual charge. By Wulf, (D.) 456, 691
Single-phase converted into two-phase system, (D.) 780
Static compensator in duplex telegraphy. By Maver, (D.) 482
Condensers in the armatures of non-synchronous motors. By Guilbert, (D.) 265
Conducting and polarizable sphere, Electric oscillations of. By Kolacek, (D. R.) 26
Conductivity. By Braun, (D.) 738
Conductor resistance met by alternating currents. By Jackson, 90
Conductors
Aluminum. By Burr, (D.) 240
Current-carrying capacity. By Crocker, 21
Individual. By Crocker, 93*
Intermediate, Properties of. By Kauffman, (D.) 28
Conductors for discharges, Best form of. By Cardani, (D.) 392
Conduit, Submarine electric, 805*
Conduit boxes
Bossert, 211*
Insulated, 148
Conduits, Interior. By Anthony, 225
Iron-armored, 115
Plain iron pipes vs. lined pipes, 280, 289, 323, 358, 387
Consonance. By Feldman, (D.) 326, 361
Continuous rails, History of. By Raymond, (D. R.) 207
Contact electricity. By Kelvin, (D.) 815; Wiedeburg, (D. R.) 393
Contact electricity of metals. By Lord Kelvin, (D.) 783
Controllers, Automatic, for elevators, 744*
Converters. (See Transformers.)
Cooking, Electric, Economy in. By Woodbridge, (D.) 817
Copper
Analysis of. By Holland, (D.) 101
Cast
High conductivity. By Channing, (D.) 482, 540
Tests of. By Brown, (D.) 329
Conductivity. By Grimaldi and Platania, (D.) 815
Demand for, 284
Production
Hoepfner process, (D.) 28
Recent developments in. By Brown, 331
Refining. By Holland, (D. R.) 268; Kershaw, (D.) 179; Ulke, (D. R.) 72
History of. By Kershaw, (D.) 144
Multiple and series systems of. By Kroupa, (D.) 456
Copper deposits, Elmore process, (D. R.) 28
Copper voltameter. By Foerster, (D.) 816
Copper works at Widnes, (D. R.) 456
Cotton bleaching. By Vogelsang, (D.) 456
Cox thermoelectric generator, 630*
Cranes
Dock, (D. R.) 564
Shop. By Grimshaw, (D. R.) 537
Cresson loose pulley, 567*
Cross oil filter, 595*
Crucible fusions, Electricity for. By Leeds, (D.) 210
Culm, Power from, Leavenworth, Kan., (D.) 814
Culvert for bare copper mains, Preston, (D.) 326
Currents, Electric. By Silberstein,(D. R.) 26
Breaking by tuning fork. By Webster, (D.) 594
Direct, from alternating. By Davis, 54*
Energy of. By Gross, (D. R.) 267
Foucault
Armature reaction. By Besso, (D.) 590; Westphal, (D.) 463
Pole pieces and conducting wires. By Desombre, (D.) 391
Magnetic and electric, Analogy between. By Braun, (D.) 324
Path of, Insulating medium surrounding a conductor the real path, 421*
Physiological and therapeutic action of high-frequency. By D'Arsouval, (D.) 566; Rocher, (D.) 268
Thermo-electric, in molten metal. By Backhmetieff and Stambolieff, (D.) 294, 426
Time variations of variable. By Braun, (D.) 738
(See also Alternating currents; Electromotive force.)
Curves
Alternating current, Apparatus for exhibiting. By Braun, (D.) 512
Determining, Device for. By Marcher, (D.) 594
Railway motor, (D.) 25
Cutouts
Bryant bug, 297*
English, Maximum and minimum, (D.) 564
General electric, Use as ceiling board, 631*
High voltage. Pass and Seymour, 568*
Newton bug, 484*
Peru, 596*, 639*, 666*
Pettingell-Andrews, 541*
Reynolds self-insulating, 146*
Cyanide process. By Butters, (D. R.) 427; Richards, (D. R.) 241
Cyanides for electric batteries and accumulators. By Platner, (D.) 426
Cylinder, Emerson illumination, 75*

D

Damper regulator, Hydraulic, 596*
Dark light. By Le Bou, (D.) 208
Davy-Faraday Research Laboratory opened, 84
"Dead man's curve, New York," 317*
Deaths from lightning. By Turquan, (D.) 210
Decimal division of the angle and of time. By Hospitalier, (D. R.) 565
Detroit Telephone Co., 845*
Diagrams, Conventional. By Tanner, (D.) 242
Diamonds
Action of cathode rays on. By Moissan, (D.) 565
Artificial production of. By Moissan, (D. R.) 330
Transformation into graphite. By Moissan, (D.) 660
Diaphragms, Hoepfner, (D.) 241
Diatrine insulating material, (D.) 594
Die head, Besley, 74*
Diehl combination fan and electrolier, 396*
Dielectric constants. By Abegg, (D.) 209
Determination of. By Smale, (D.) 817
Electric oscillations for determining. By Nernst, (D.) 739
Low temperatures. By Abegg, (D. R.) 660
Ice and alcohol. By Dewar and Fleming, (D.) 510
Liquids, Effect of temperature on. By Hasenoehri, (D. R.) 660
Solid bodies, Method of determining. By Starke, (D.) 329, 692
Dielectric resistance. By Drude, (D. R.) 782
Temperature corrections for. By Appleyard, (D.) 782
Dielectrics
Capacity and residual charge as affected by temperature and time. By Hopkinson and Wilson, (D. R.) 267, 815, 851
Conversion of electrical energy in. By Threlfall, (D.) 691
Insulating properties. By Hanchett, 193*; Willyoung, 264
Law of. By Hopkins and Wilson, (D.) 691
Magnetic field and. By Duane, (D.) 267
Digest for 1896, (D.) 30
Dimensions of electric and magnetic quantities. By Joubin, (D.) 783
Discharge by X-rays, Effect of density of surrounding gas. By Child, (D.) 691
Discharge knobs. By Swyngedauw, (D.) 178, (D. R.) 208, 267
Discharge of conductors with variable capacity, resistance and inductance. By Petrovitch, (D.) 510
Discharge rays. By Hoffmann, (D.) 455
Discharges, Electric. By Hoffmann, (D.) 294; Wesenbouck, (D.) 294
Conductors
Best form of. By Cardain, (D.) 392
Discontinuous conductors. By Vicentini, (D.) 392
Conversion into Roentgen rays. By Puluj. (D.) 240
Heat developed. By Kaufmann, (D.) 782
Influence of light on the disruptive discharge. By Warburg, (D.) 510

Discharges, Electric.
Radiant. By Hoffman, (D.) 737
Residual Theory of. By Houllevigne, (D.) 455
Resistance to. By Cardani, (D.) 178
Static and dynamic explosive potentials. By Swyngedauw, (D.) 782
Voltages for discharges from points. By Wesendouck, (D.) 426
Discharging balls. By Petrozzani, (D.) 101
Distribution of electrical energy, Principles of. By Crocker, 21, 60, 93, 125, 167, 197, 236*, 261
Dredging, Electric power, Bannock, Montana, (D.) 391
Drill case, Weiss & Bros., 568*
Drill operated by flexible shaft, 663*
Drills, Electric mining plant. By Snell, (D.) 391
Portable, 430*, (D.) 265
Drying air cables. By Petsck, (D.) 591
Du Bois-Reymond, Prof. Emil, Death, 7, (D. R.) 102, 180
Dust figures. By Archer, (D.) 294
Duties on carbons and electrodes, 687
Dynamometer car, (D. R.) 207
Dynamos. By Atkinson, (D.) 849; Mordey, (D.) 780, 813
Ahlm-Edwards, 269*
Alternating current
Blondel, (D.) 207
History. By Houston & Kennelly, 20*
Hutin and Leblanc. By Guilbert, (D.) 207, 239, (D. R.) 24
Iron losses, Caluclation. By Behn-Eschenburg, (D.) 207
Loss of voltage. By Behn-Eschenburg, (D.) 24
Maximum output. By Jackson, 378, 442
Mordey, (D. R.) 292
Novel. By Shepardson, (D.) 780
Parallel operation. By Frankenfield, (D.) 453; Lincoln, (D.) 591; Raymond, (D.) 454, 657; Woodbridge, (D.) 590
Revolving-field, 853*
Self-excited, Theory of. By Brillouin, (D.) 563
Warren, 429*
Arc, Melbourne station, 6*
Atkinson alternator. By Gay, (D. R.) 509
Calculation of. By Arnold, (D.) 69, 177
Calculation of density of current in armature-wire. By Girault, (D.) 424
Characteristics, Methods for determination of. By Stine, (D.) 325
Commutatorless continuous current. By Poncin, (D.) 292, 479, 509
Compound, run in multiple, (D.) 178
Connections of railway generators. By Woodbridge, 502*
Construction
Mechanical. By Weymouth, (D. R.) 99
Modern type of. By Schulz, (D.) 239
Design of. By Seidener, (D.) 424
Design of direct-current machines, with reference to sparking. By Fischer-Hinnen, 385*, 419*, 446
Designing biplora drum. By Kennedy, (D.) 24.
Direct—connected
Bolton, Eng., 108*
Commercial, 741*
Gas engine and dynamo, 107*
Onondago Dynamo Co., 364*
Direct-current, Quaker City, 513*
Dissimilar action of similar machines. By Baxter, Jr., 259
Double field, for three-wire systems. By Rothert, (D.) 623, 689
Efficiency, Determining. By Bary, (D.) 24
Equalizer on polyphase generators. By Wilcox, (D.) 591
Failure to start. By Baxter, (D.) 780
Ferranti alternator. By Gay, (D. R.) 509
High frequency, Tesla system, (D.) 360
Inoperative unipolar. By Markle, (D.) 177
Inspection of, Card Electric Co., 363*
Ferranti method, 390
Short invention, 269*, 359
Ironclad multipolar, Central Electric Co., 485*
Onondago direct-connected, 212*
Parallel operation. By Steinmetz, 8
(See also above, Alternating current.)
Parsons, Test of. By Hunter, (D.) 325
Polarity test. By Thomas, (D.) 657
Regulators, 787*, (D.) 26
Safety appliances on. By Moffat, (D.) 591
Shunt, efficiency tests without a dynamometer. By Conner, (D.) 456
Shunt winding of, (D.) 69. By Steele, (D.) 99
Six-pole 7-kw, Holland, (D. R.) 590
Size, weight and pure, Relative. By Wilson, (D.) 424, (D. R.) 590
Slow speed multipolar, C. & C., 628*
Small air-space. By Atkinson, (D.) 849
Speed and efficiency, Relation between, 191. By Hansard, 203
Three-wire system. By Ettingshausen, (D.) 265; Kenny, (D.) 391; Rasch, (D.) 735; Ritterhausen, (D.) 813; Rothert, (D.) 265
Triumph Electric Co., 785*
Unipolar, 220-volt. By Charry, (D.) 849
Wagner direct-current, 664*

E

Eagle Electric Mfg. Co. Mouthpiece for speaking-tube, 146*
Earth
Conductivity of. By Bell, (D.) 330; Smith, (D.) 659
Magnetism of. By Baxendell, (D.) 691; Moureau, (D. R.) 209
Earth air-currents, Vertical. By Bauer, (D.) 661
Earth currents
Influence on, of subsoil water level. By Bachmetieff, (D.) 455
Measuring in cable testing. By Schoenan, (D.) 179
Earthquakes, Submarine. By Milne, (D.) 329
Edison, Reminiscences of. By Phillips, (D. R). 29
Edison Electric Illuminating Co. of N. Y., Report, 225
Education, Electrical engineering. By Crocker, (D. R.) 103
Electric heating, (D.) 853
Electric lamps. (See Arc lamps; Incandescent lamps.)
Electric lighting subways. By Marer, Jr., 715*, 766*, 803*
Electric medium, The. By Lamar, (D.) 783
Electric motor carriages. (See Motor vehicles.)
Electric power, future development of. By Bell, (D.) 69; Dolbear, (D.) 102
(See also Central stations; Isolated plants; Railways, electric; Transmission of electric power.)
Electric quantities, Dimensions of. By Joubin, (D.) 362
Electric railways. (See Railways, Electric.)
Electric waves. By Drude, (D.) 209
Absorption by a terminal bridge. By Barton and Bryan, (D. R.) 209, 361
Apparatus for study of. By Bose, (D. R.) 209, 669
Hertz, Short. By Righi, (D.) 593
Passage through tubes. By Rayleigh, (D. R.) 267, 565
Refraction of short waves. By Lampa, (D.) 815
Speculations. By Prof. Crookes, 252
Theory of stationary waves. By Drude, (D. R.) 783
Electric welding. By Walker, (D. R.) 180
Electrical Bureau of the National Fire Underwriters, (D. R.) 482
Electrical distribution, Principles of. By Crocker, 21, 60, 93, 125, 167, 197, 236, 261*
Electrical energy, Conversion of fuel energy, 1. By Thomson, 4
Electrical engineering, Education in. By Crocker, (D. R.) 103
Foresight in. By Woodbridge, (D.) 784
Germany, Progress, (D. R.) 180, 210
Electrical engineers, Volunteer corps, England, 827
Electrical industries in Russia. By Rosstin, (D. R.) 268
Electrical machinery, Care of. By Baxter, (D.), 99, 360, 509, 700; Harris, (D. R.) 590
Electrical Mercantile Agency, 105
Electrical patents of 1883, English, (D.) 102
Electrical phenomena, Mechanical conceptions of. By Heinke, (D.) 293
Electrical progress in 1896, 3. By Armstrong, (D. R.) 180; (D.) 210
Electrical Supply and Telephone Co., Telephones, 34*
Electricity
Age of. By Tesla, (D. R.) 428
Atmospheric, in high regions. By Le Cadet, (D.) 660
Biographical history, (D.) 30, 457, (D. R.) 363
Contact. By Kelvin, (D.) 815; Wiedeburg, (D. R.) 393
Epoch-making events in. By Stockbridge, (D.) 482, 784
Mechanical theory of. By Franklin, (D.) 393; Haycraft, (D. R.) 241; Richard, (D. R.) 30; Whitwell, (D.) 178
Production from
Carbon, 280, 320
Coal. By Case, (D. R.) 101
Fuel. By Weber, (D.) 362
Gases. By Andreas, (D.) 427
Heat, 486; By Cox, (D.) 784
Theory of. By Vaschy, (D.) 783
Electro-capillary attraction. By Chassy, (D.) 392
Electro-chemical apparatus and processes, (D.) 241
Electro-chemical industries, Success of (D.) 145
Electro-chemical lecture apparatus. By Nernst, (D.) 241
Electro-chemical theory, (D. R.) 456; By Bucherer, (D. R.) 241
Electro-chemistry
Development of, (D. R.) 28, 179; By Perger, (D. R.) 209; Weyer, (D. R.) 241
Progress in the U. S. By Ulke, (D.) 661
Relation to organic chemistry. By Elbs, (D.) 539
Electrodes
Improvements. By Weyer, (D. R.) 28
Platinized, and resistance measurements. By Kohlrausch, (D. R.) 512
Electro-dynamics
Foundations of. By Wiechert, (D.) 294
Principles of. By Wiechert, (D. R.) 660
Electro-dynanometer, Helmholtz. By Kahle, (D.) 29, 566
Electrolysis. By Bucherer, (D. R.) 852
Alternating-current, Lead sulphate in, (D.) 71
Carbon electrode for. By Lessing, (D.) 241
Electrolysis in the extraction of metals, (D.) 456
Electrolysis from electric railway service. By Rowland, (D.) 658
Electrolysis of fused salts. By Ccheneveau, (D.) 593
Electrolytes
Conductivity of, effect of great current strength of. By Richards and Trobbridge (D.) 593
Densities and conductivities. By Loomis, (D.) 783
Electric discharge through. By Cardani, (D) 426
Electrolytes
Resistance of, Measurement. By Wien, (D.) 427
Resistance to alternating discharges. By Cardani, (D.) 101
Electrolytic dissociation, Theory of. By Carara, (D. R.) 512
Electrolyzer, Laboratory, (D. R.) 209; By Wehrlin, (D.) 661
Electro-magnetic apparatus. By Koenig, (D.) 481
Electro-magnetic equations. By Vaschy, (D.) R.) 783
Electro-magnetic formulas, Generalization of. By Vaschy, (D. R.) 361
Electro-magnetism
Calculations in. By Vaschy, (D. R.) 209
Errors in. By Vaschy, (D. R.) 101
Electro-magnets, Economy in design. By Goldsborough, 196
Electrometers
Capillary, Capacity of. By Kasankin, (D.) 512
Differential instrument, Use as. By Arno, (D.) 662
Idiostatic. By Barus, (D.) 394
Low potentials. By Perot and Fabry, (D.) 268, 295
Quadrant, (D.) 512
Electromotive force
Analysis of various types, 96
Connection in series of co-frequent simple-harmonic. By Houston and Kennelly, 354, 473, 526
Effective values. By Houston and Kennelly, 285*
Generated by cutting lines of force. By Kingsland, (D.) 481
Graphical method for determining the effective E. M. F. from the voltage curve. By Fleischmann, (D. R.) 268, 815
Magnetism, Influence of, upon E. M. F. By Bucherer, (D. R.) 482
Measuring E. M. F. of cells. By Negreanu, (D.) 739
Simple-harmonic E. M. F. S. By Houston and Kennelly, 166, 234
Standards of. By Armagnat, (D. R.) 29
(See also Currents.)
Electro-physics. By De Heen, (D.) 426
Electro-pyrometer, An. By Bohm, 366*
Electrostatic theory. By Leray, (D. R.) 510
Electro-therapeutic terms, (D.) 268
Elevated railways
Chicago, Loop terminal, (D.) 143
New York, Electricity on, 264, 279, 283, 318*, 347, 452
Elevators, Electric. By Ravenshaw, (D. R.) 564
Accumulators for, 704
Controllers, 695*, 744*
Development of, 447*, 467, 475*, 506, 581
Electron, Description of, 581*
Germany, (D. R.) 177
Otis, Description of, 643*, 684*
Sprague, 530*, 557*
Tests. By Sprague, (D. R.) 658
Worm gearing, (D. R.) 69
Emerson Electric Mfg. Co.
Fan motors, 431*
Illumination cylinder, 75*
Motor combination, 337*
Energy of the current. By Gross, (D. R.) 267
Variations of. By Vaschy, (D. R.) 361
Engine governor for electrical work. By Taylor, (D. R.) 177
Engine indicator, Crosby, 667*
Engines
Ball medium speed, 299*
Discussion before I. C. E., 781
Fischer automatic, 741*
Halsey steam motor, 397*
Lubrication, automatic, 542*
Marine, Prevention of racing in. By Harlan, (D.) 394
Selection of, for power plant, 349
Sioux City corliss, 333*
Equalizers
Churchward, 32*
Polyphase generators equipped with. By Wilcox, (D.) 591
Principles of, (D.) 178
Rotary, Principles of, (D. R.) 177
Equalizing connections for compound wound dynamos in multiple. By Keller, (D) 361
Erie Telegraph & Telephone Co., annual report, 604*
Ether
Electric conductivity of. By Trowbridge, (D.) 593
Light and ether. By Friedrich, (D. R.) 240
Theories, Prospective development. By Fessenden, 9, 176
Expositions
Bicycle, New York, 262
Electrical, Turin, 1898, proposed, 19
Gas, New York City, 194
New South Wales, 254
Paris, in 1900, 263, (D. R.) 296, 363
Tennessee, 252, 580
Export trade, Electrical. By Knudson, (D.) 102
American, to Northern Europe. By Kirkegaard, 226
Eye surgery, Magnet for, (D.) 693

F

Factories and Shops, Electric Power in. (D.) 537; By Bell, (D.) 781; Chirehugh, (D.) 735; Conradson, (D.) 480; Jackson, (D.) 142, 781; Scott, (D. R.) 265, (D.) 391, 480, 564, 689, 735, 814, 850.
Combining manufacturing and electric lighting, 524, 525

Factories and Shops
- Keating Wheel Co., 243*
- Krippendorf & Dittman Co. 31*
- North Tonawanda, N. Y., 183*
- Railroad shops, 820
- Rothschild & Co., Trenton, N. J., 500*
- Shafting vs. electric power. By Benjamin, (D.) 781
- Tiffany & Co., Forest Hill, N. J., 469*

Fans, Electric
- Alternating current, 430*, 483*
- Bates, 666*
- Centrifugal power for, (D.) 69
- Diehl combination fan and electrolier, 396*, 853*
- Edison, 665*
- 1897 models, (D. R.) 564
- Experiments, M. By Walker, (D.) 657, 689, 781
- Induction, Emerson, 431*
- Paragon, Novel, 335*
- Roth Bros., 513*
- Tuerk alternating current, 338*
- Twentieth Century, 629*
- Western Electric Co., 514*
- Westinghouse alternating current, 486

Farming, Electricity in, 192, 195*, (D.) 623
- France, (D.) 424
- Mecklenburg, Germany, (D. R.) 239

Fault localizer, Direct reading. By Raphael, (D.) 427
Feathers, Electricity from, (D.) 738
Feed wire splicer, Ohio Brass Co., 595*
Feeder junction box, Cloos, 181*
Feeder regulation in central stations. By Crocker, 125*
Fenner gas engine, 627*
Ferranti, Biographical sketch of. By Scholey, (D. R.) 428
Ferraris, Prof. Galileo, 224, 447; By Arno, (D. R.) 663; Carhart, 284*
Fessenden roentgen ray apparatus, 514*
Field coil, Testing the resistance when instruments are not available. By Porter, 350
Filaments. (See Incandescent lamp filaments.)
Fire alarm box, requisites of a perfect. By Johnson, (D.) 428
Fire alarm installation, (D.) 540
Fire alarm system, Berlin exhibition (D. R.) 102
Fires due to leakage of electricity, Prevention. By Bathhurst, (D.) 425
Fischer automatic engine, 742*
Fluorescing salts. By Edison, (D. R.) 101
Fort Wayne Telephone Co., Report, (D. R.) 296
Fountains, Electric
- Brooklyn, (D. R.) 739
- Budapest exhibition, (D. R.) 25

Free lamps. (See Central stations, Lamp economy.)
French Physical Society Exhibition. By Raveau, (D.) 692
Frequency, Synchronous motor for determining. By Moler, (D.) 394, 482
Frequency indicator. By Besso, (D.) 626; Meyer, (D.) 268, 329, 692
Frequency measurements. By Smale, (D.) 783
Frequency transformation of alternating currents. By Patten, 758*
Frink, I. P.
- Cluster reflectors, 741*
- Forty years of light, 181
- Window reflector, 786*

Fuel energy into electrical energy, 1. By Thomson, 4
Furnaces, Electric
- Construction of. By Kuester and Dolezalek, (D.) 330
- Distillation, (D. R.) 28, 268
- Laboratory. By Bonna and Lekoyer, (D.) 817
- Lelievre system, (D.) 784
- Metallurgical purposes. By Borchers, (D. R.) 28
- Recent results with, (D.) 179
- Reducing iron, (D.) 28
- Smelting in. By Heibling, (D.) 594

Furnaces, Open hearth, Charging. By Head, (D.) 692
Fuse block and lightning arrested, Tests at Niagara Falls, (D.) 70
Fuse boxes, Lakon single pole primary, 542*
Fuses
- Branch circuit fuses. By Sharpsteen, (D.) 592
- High voltage and lightning arrester. By Fischer-Hinnen, (D.) 736
- Rating and testing safety, Method of. By Perrine, 161
- Siemens & Halske system, (D. R.) 782

G

Galvanometers
- Astatic. By Broca, (D.) 427
- Balance, Mueller system, (D.) 295
- Classification of. By Fitzgerald, (D.) 482
- Construction of. By Des Coudres, (D. R.) 662; Sheldon, (D.) 662
- D'Arsouval. By Dujon, (D.) 329
- Deflections, Reading. By Hastings, (D.) 739
- Design of. By Holmann, (D.) 539
- Interference. By Wadsworth, (D.) 852
- Liquid damping for. By Jacobs. (D.) 101
- Motion of a damped needle. By Lendl, (D.) 210
- Sensitive, Design for. By Mendenhall, (D.) 594
- Siemen's universal, (D. R.) 783
- Suspension apparatus. By L. F. W. S., 86*
- Vibration. By Granquist, (D.) 512
- Waste space around the needle. By Gray, (D.) 209

Garl Electric Co., Telephones, 486*
Garlock waterproof hydraulic packing, 297*
Gas
- Deaths from, in Mass., 315
- Electric ignition, (D.) 663
- Natural, Failure in U. S., (D.) 850

Gas burners, Lighting and extinguishing, at Aix-le-Bains, (D.) 594
Gas engines
- Combined with dynamo, 107*
- Electric lighting, (D.) 360
- Fenner improved, 627*
- Palmer, 819*

Gas exposition, New York, 194
Gas jets, Ingenious system of lighting, 264
Gas lighting from a distance, (D.) 784
Gas plants compared with central stations. By Seamon, (D.) 361
Gaseous fuel as a means of cheapening electricity. By Perry, 201
Gases
- Action of electric discharges on. By Villari, (D.) 592
- Conductivity of hot gases. By Petinelli and Marolli, (D.) 392
- Electrical conduction in. By Baly, (D.) 240
- Electrification by Roentgen rays. By Rutherford, (D.) 538, 592
- Temperature and ohmic resistance. By Trowbridge and Richards, (D.) 481
- Transparency of, to Roentgen rays. By Benoist, (D.) 294

Gauges, High vacuum pressure. By Sutherland, (D.) 267
General Electric Co.
- Annual report, 562, 575
- Fan motors, 430*
- Lightning arrester, 567*
- Locomotives, Electric, Experimental work, 487*
- Railway motors, 485*
- Switchboard panels, 271*
- Transformers, Natural draft, 105*

Geneva exhibition. By Guye, (D. R.) 30; Ritter, (D.) 142
Globe Electric Heating Co., Heaters, 37*
Globe lightning. By Hagenan, (D.) 784
Globes, Holophane. By Lewes, (D.) 25
Gold
- Deposition of. By Andreoli, (D. R.) 28
- Dissolving in chloride of bromium. By Gage, (D.) 27
- Electrocyanide extraction, Keith process, (D.) 593
- Electrolysis of, (D.) 241
- Recovery from cyanide liquors, (D.) 482

Gold dredging, Electric power, Montana, (D.) 391
Gold extraction. By Andreoli, (D.) 738, 816
- Haycraft process, (D.) 456

Government Printing Office, Electricity in, (D. R.) 208
Governors
- Steam engine, for electrical work. By Taylor, (D. R.) 177
- Water wheel, Lombard, 315*

Grade crossings, New York, Bill in Senate, 536
Greenland magnetic observations. By Putnam, (D. R.) 661
Ground detectors, 237, 269*
Gun magnets. By King, (D.) 241
Gutta percha extraction, (D.) 633
Gutta percha in French Soudan, (D.) 29

H

Hair, Electricity from, (D.) 738
Hale, G. D., Cable testing, 441*
Hart & Hegeman snap switches, 428*
Hatter's electric iron, 543*
Haulage system, Electric, N. O. & W. R. R. at New Orleans. By Smith, 440, 443*
Heat, Direct conversion into electricity. By Cox, (D.) 784
Heat of vaporization, Influence of the electric state of the surface of a liquid on. By Fontaine, (D. R.) 361
Heaters, Electric
- Combination, Globe Electric Co., 37*
- Current consumption. By Douglas, (D.) 510
- Economy of, (D.) 70
- "H. W. J.," for cars, 34*
- New forms, 322

Heating, Electric, (D.) 853
- Apparatus, Construction of. By Colin, (D.) 512
- Lewiston, Me., (D.) 482
- Niagara Falls station. By Dunlap (D.) 513
- Rothschild shirt factory, 496, 500*

Hebrew Technical Institute, N. Y. Electrical Laboratory, (D. R.) 394
Heintz steam saver, 785*
Heliograph, Use of in war, 467
Henry, The, (D.) 456
High voltage plants. (See Central Stations, High voltage plants.)
Hoists, Electric, for mining, 458*, (D.) 537, 590
Holophane globes. By Lewes, (D.) 25
Hotel Manhattan, Electric plant, 55*
Human body, Resistance of. By Spehl and Sano, (D.) 103
Hydraulic damper regulator, 596*
Hydrogen
- Direct union with carbon. By Bone and Jordan, (D.) 738
- Effect of ultra violet light on. By Wild and Harker, (D.) 455

Hypochlorites, Production of. By Oettel, (D.) 209
Hysteresis
- Magnetic. By Berg, (D.) 27
- Magnetization by oscillating discharges. By Klemencic, (D.) 209
- Transformers. Effect of form of voltage curve. By Fleischmann, (D.) 815

I

Ice, Dielectric constant at low temperatures. By Dewar and Heming, (D.) 510
Impedance factor in alternating-current circuits of large section. By Picou, (D.) 538, 659
Impedance in simple alternating-current circuits. By Houston and Kennelly, 806
Impedance law of the condenser discharge. By Petrovitch, (D.) 455
Imperial electric motor, 398*
Import duties on electrical machinery, (D. R.) 210
Impulse water-wheel experiments. By Hitchcock, 706,* 768
Inauguration at Washington, Electric lighting, 310
Incandescent lamp base, Porcelaine, 397*
Incandescent lamp cord adjuster, 334*
Incandescent lamp filaments
- Carbonizing. By Krueger, (D.) 457
- Conductivity of, and the space surrounding them. By Howell, 251, 253
- Interesting data, (D.) 142
- Manufacture of. By De Laud, (D. R.) 590
- Motions of. By Hoffman, (D.) 691
- Paris, (D. R.) 25
- Radiating surfaces of. By Howell, 53
- Temperature, Variations in. By Janet, (D.) 849
- Treated with boric acid, Williams' system, (D.) 325

Incandescent lamp guard, Underwood, 483*
Incandescent lamp sockets
- Anchor Electric Co., 33*
- Edison. By Bautze, (D.) 479
- New waterproof, 595*
- Regulating, 149*

Incandescent lamps
- A. E. G., 297*
- Carbon deposit. By Popow, (D.) 207
- Cars, Street railway. By Sonneberg, (D.) 453
- Columbia Lamp Co., 486*
- Disconnected, Glowing of. By Amstutz, (D.) 661
- Discussion of. By Terry, 172
- Economy of. By Weber, (D.) 509
- Exhaustion of, Chemical method, (D.) 480
- High and low voltage, (D.) 391; by Howell, 705
- Improvements. By Clegg, (D.) 207
- MacIntire incandescent arc, 299
- Manufacture of. By De Laud, (D. R.) 590
- Manufacturers of, under Westinghouse patents, 334
- Measurements of. By Bussmann, (D.) 292; Gusinde, (D.) 99; Reggert, (D.) 142
- Mining, Sussmann system, (D.) 537
- Renewal of, Lynn, Mass., 696*, (D.) 780
- Series, on arc circuits. By Crocker, 60
- Shelby, 215*
- Standard candle-power, Report of committee, 752
- Standard tests of, 347, 350
- Standardizing, (D.) 564
- Tests of Packard, 336
- Ultra, (D.) 69
- Westinghouse patents, 226

Incandescent lamps vs. commercial heaters. By Porter and Warner, (D.) 180
Independent Telephone Association, Constitution, 847
Independent Telephone Companies
- Detroit convention, 799, 811
  - Delegates, 841*
  - Exhibits, 846*
  - Object of convention. By Judge Thomas, 799, 811
  - President's address, 840, 845
  - Report, 827, 838
- Legal status and prospects for the future, 799, 811

Independent telephone exchanges, Trunk line connections, 807
Index of engineering literature. By Perrine, (D. R.) 482
Indicators
- Electrically controlled, (D.) 692
- Steam engine, 667*

Inductance
- Alternating-current circuits, (D.) 326; By Houston and Kennelly, 621
- Principles, applied to broken circuits, (D.) 179

Induction, Measurements of coefficients of. By Granquist, (D.) 739
Induction balance, Interferential. By Barus, (D.) 209
Induction booster. By Davis, 390
Induction coils, (D.) 456
- Automatic interrupter for. By Sayen and Willyoung, (D.) 362
- Electrical measurements. By Nodon, (D.) 739
- Insulation of (D.) 179; By Thompson, (D.) 329
- Making of. By Hanchett, (D.) 179
- Operating, New method, 324
- Operating from lighting circuit. By Norton and Lawrence, (D.) 327
- Roentgen ray work, 597*, 788

Induction currents, action of. By Meyer, (D.) 426
Inductive drop in alternating-current lines, (D.) 455
Injector, Lukenheimer automatic, 787*
Inspection bureaus, Electrical installations, 828
Installations, Electric. By Bouchet, (D.) 454, 510
- N. Y. Fire Dept. requirements, 213*
- Rules for, 756
  - Germany, (D. R.) 538
  - Switzerland, (D.) 815
- Switzerland, (D. R.) 70
- Temporary, in unfinished buildings, 181
- Testing. By Zingler, (D.) 25

Instrument car of the Munich station. By Uppenborn, (D.) 266
Instruments, Electrical, Mounting of. By Armagnat, (D.) 512

Insulating material, Asbestos as, 458
  Diatrine, (D.) 594
  Properties of different materials. By Hanchett, 193*
Insulation
  Armature cores. By Ilimer, (D.) 563
  High frequency currents, 536
  Induction coils, (D.) 179. By Thompson, (D.) 329
  Measurements of circuits. By Skutsch, (D.) 512; Travailleur, (D.) 295
Insulation resistance
  Cables, Street railway. By Uppenborn (D.) 29
  Three-wire systems, Measurement of, While at work. By Houston & Hennelly, 309
  Voltmeter, Measurement of. By Hale, (D.) 29
Insulators
  High potential, Locke, 33*
  Oil as an insulator, (D.) 512
  Porcelain, White-Crosby, 37*
Insurance as affected by electrical construction. By McLaren, 140
Insurance of municipal central stations. By Pearson, (D. R.) 240, 266
Interferential induction balance. By Barus, (D.) 209
Interlocking systems, Electric, (D.) 180. By Hollins, (D.) 268, 594; (D. R.) 427
International Society of Electricians, April meeting, 556
Interrupter, Thermic, (D.) 70
Inventor and the Technical Journal. By Davis, 688; Scheible, 640, 641, 768
Ions
  Arrhenius theory. By Kuester, (D. R.) 28
  Migrations of, Theory. By Hargreaves, (D. R.) 28
  Theory of. By Zuman, 555
Iron
  Electrolytic. By Houllevigue, (D.) 816
  Magnetic properties and the Steinmetz coefficients. By Ebeling and Schmidt, (D.) 738
  Temperature effects on magnetic and electric properties. By Morris, (D.) 738
Iron for transformer cores. By Clinker, (D.) 391
Iron losses in toothed armatures, Calculation of, (D.) 325
Irrigation plant at Korachieh, Egypt, (D.) 480
Isolated plants
  Accumulators in. By Appleton, (D.) 659
  Armour Institute, Chicago, (D. R.) 325
  Broomhill, Eng. By Salomons, (D.) 659
  Country houses. By Rosling, (D.) 564
  Evolution of. By Davis, (D. R.) 100, 144, 178
  Florida Hotel, (D. R.) 70
  Hillside Home, Scranton, Pa. By Coho, (D. R.) 510
  Hotel Cecil, (D.) 814
  Hotel Manhattan, 50*
  Medical College, (D.) 26
  N. Y. Telephone Co., Dey st., 384*
  Penn. State Hospital for the Insane, (D. R.) 240
  St. Paul Building, N. Y., 411*
  San Francisco store, (D.) 480
  Siegel-Cooper stores, (D. R.) 369
  Waldorf Hotel, 74, 148
Isolated plants vs. central stations, (D.) 208
Italian Electro-Technical Association (D. R.) 428

J

Japan, Electrical work in, 529
Jeffrey Mfg. Co., Coal and ash handling plant, 35*
Johns, H. W.
  Electric heaters, 34*
  Foggie clamp insulator, 485*
Johnstone, W. H., First electric railway passenger, 589
Joist-boring machine, 216*
Junction box and motor cut-out, Pass & Seymour, 568*

K

Kataphoresis in medicine. By Mewes, (D.) 853
Keating Wheel Co., Electric power plant, 243*
Keely motor, Inspection of, 830
Kent lubricating compound, 150, 696
Keystone portable volt metres, 567
Knott Roentgen ray apparatus, 396, 541*
Krippendorf & Dittman Co., Electric plant, 31*

L

Laboratory, Triphase machinery for. By Hanappe, (D.) 657
Lag, Determining the angle of. By Rayleigh, (D.) 662
Lag and pipe wrench, Martini, 244*
Lakon fuse boxes, 542*
Lamp connection diagrams, London central stations, (D.) 100
Lamp cord adjuster, Murdock, 334*
Lamps. (See Arc lamps; Incandescent lamps.)
Lantern, Arc lamp for, Branson system, (D.) 563
Lathe chuck, Magnetic, (D.) 594
Lead
  Desilverization of. By Tommasi, (D. R.) 268
  Production of alloys. By Walter, (D.) 482, 661
Lead sulphate in alternating current electrolysis, Formation of. By Sheldon and Waterman, (D.) 71
Leakage
  Best means of preventing. By Walker (D.) 850
  Three-wire system. By Krempelhuber (D.) 782
Lecture apparatus, Electro-chemical. By Nernst, (D.) 241
Lenard rays. By McClelland, (D.) 691; Thompson, (D.) 327
Leonard automatic circuit breaker, 397*
Lewis Institute. By Carman, (D.) 242
Light
  Broadening of the sodium lines by intense magnetic fields. By Dunstan Rice and Kraus, 556*; Zeenan, 555
  Distribution and diffusion. By Elliott, 127*; (D.) 239; (D. R.) 265
  Effect of magnetism on. By Kalischer, 677
  Electro-capillary, 7
  Electromagnetic theory of. By Rayleigh, (D. R.) 592
  Influence of magnetism in the nature of. By Egoroff and Georgiewsky, (D. R.) 783; Lodge, (D.) 392; Zeeman, (D.) 327, 392
  Phenomenon with low frequency currents, (D.) 691
  Photometric units, (D.) 816
  Zeeman's experiments, 408, 552, 555, (D.) 327, 426, 593; By Dunstan, Rice and Kraus, 556*
Lightships, Communication of, with the coast, (D.) 101; By Smith, (D.) 295
Lighting
  Economy of different systems. By Delahaye, (D.) 780
  Street, Paris, (D.) 24, 326
  Tests of different systems. By Joly, (D.) 207
Lighting, Electric. By Norris, (D. R.) 689
  Armory of Ninth Regiment, N. Y., 451*
  Berlin, Report, (D.) 736
  British Guiana. By Vyle, (D. R.) 240, 590
  British Navy plants, (D. R.) 392
  Cars
    At., To. & S. Fe Ry., (D. R.) 736
    Austria, Boese accumulators, (D.) 424
    Dynamo on axle, 630*
    England, 439, (D. R.) 25
  Comparison of different lights. By Jacobus, (D.) 623
  Conductors, Individual. By Crocker, 93*
  Cost
    Gas engine operation. By Christy and Hasbrouck, (D.) 239
    Public and private supply. Comparison. By Warden-Stevens, (D.) 177
  Country houses. By Graham, (D.) 510.
  Decorative, (D.) 689; By Jenness, 64*
  Drawing office arrangements, (D.) 142
  St. Louis, Specifications, (D. R.) 207
  St. Petersburg, Schemes for, (D. R.) 177
  Series systems. By Crocker, 21*
  Shops. By Pratt, (D.) 392
  Steamship "Dresden," (D. R.) 26
  Street
    Arc lamps for. By Hesketh, (D.) 563. Incandescent lamps, England, 381
  Theatre, Glasgow, (D. R.) 590
  Three-wire system. By Crocker, 126, 167
  Vacuum tube. By Edson, (D.) 360
    Moore exhibition, 685
  Washington, D. C., Inauguration, 310
  (See also Central stations; Isolated plants.)
Lighting gas jets, Ingenious system of, 264
Lightning. By Siemsen, (D.) 853
  Deaths from. By Turquan, (D.) 210
  Duration of flashes. By Kendrick, (D.) 428
  Effects of. By Jones, (D. R.) 693
  Freaks of. By Latta, (D.) 659
  Globe. By Hagenan, (D.) 784
  Protecting houses against. By Koch, (D.) 627
  Protection of Mt. Etna from. By Fraze, (D.) 692
Lightning arresters. By Findeisen, (D.) 850
  High tension alternating circuits, 106*
  Magnetic blow-out, 567*
  New form. By Goerges, (D.) 564
  Wirt alternating current, 596*
Lightning rods. By Heap, (D. R.) 540
Lines of force
  Circular. By Haycraft, (D.) 393
  Cutting, (D.) 815
Linton & Southwick switches, 515*
Liquid coherers and mobile conductors. By Appleyard, (D. R.) 510
Liquids
  Dielectric constant, Effect of temperature on. By Hasenoehri, (D. R.) 660
  Hall effect in. By Bayard, (D. R.) 26
  Resistance of liquids in motion. By Bosi, (D.) 783
Lock, Magnetic, for miner's lamp, (D.) 428
Locke high potential insulators, 33*
Locomotive turntable, Milwaukee, (D. R.) 735
Locomotives, Electric. By Henry, (D.) 100; Swann, (D.) 690
  Comparison of various suburban, 554
  Davidson's 1840, 576, 589
  Elevated railway, N. Y., Development, 318*
  General Electric Co.'s experimental work, 487*
  Heilmann, (D. R.) 178, 240, 564; By Drouin, (D.) 509; Jacquin, (D.) 658; Leonard, (D) 659.
  Jungfrau Railway, (D.) 265
  Mining, (D.) 143, 782
  New Haven, Switching, 75*. By Mullin, (D.) 425
  Requirements, for high speed and heavy traction, 551, 553*
  Thofehrn, (D.) 143
  Wharf Haulage system, 444*
Logonda tube cleaner, 37*
Lombard water wheel governor, 315*
Looms, Electric driving of, (D.) 624
Loop railway terminals, Chicago, (D.) 143
Lubricant, Kent, 150, 696
Lubrication, Automatic, of engines, 542*
Luminous efficiency of the alternating current arc. By Blondel, 223, 232*, 258*
Lunkenheimer Co.
  Automatic injector, 787*
  Valves and gauges, 543*
Lynn Incandescent Lamp Co., New plant, 696*

M

McEvoy telephone specialties, 430*
Machine tools, Electric driven. By Rowan, (D.) 689
Magnet coils, Repair of. By Baxter, (D.) 509
Magnetic amalgams. By Nagaoka, (D. R.) 241
Magnetic balance, Du Bois. By Ebeling and Schmidt, (D.) 145
Magnetic bodies
  Hard and soft. By Kohn, (D.) 267, 511
  Susceptibility. By Lombardy, (D.) 456
Magnetic concentrating practice. By Nitze, (D.) 482
Magnetic Dip in Etruscan times. By Folgheraiter, (D.) 267
Magnetic elements at sea, Determination of. By Guyon, (D.) 268
Magnetic force acting on moving electrified spheres. By Schuster, (D. R.) 209
Magnetic hardness. By Beck, (D. R.) 241
Magnetic increment of rigidity in strong fields. By Day, (D.) 738
Magnetic induction in discs rotated in the earth's field. By Martens, (D. R.) 455
Magnetic observations in Greenland. By Putnam, (D. R.) 661
Magnetic quantities, Dimensions of. By Goubin, (D.) 362
Magnetic researches with iron and steel. By Egger, (D. R.) 691
Magnetic separation of non-magnetic materials. By Raymond, (D.) 296
Magnetic separator, Wetherill, (D. R.) 482
Magnetic viscosity. By Martens, (D.) 209
Magnetism
  Light and magnetism. By Lodge, (D.) 392; Kalischer, 677; Zeeman, (D.) 327, 392
  Mechanical conceptions of. By Nichols and Clark, (D.) 393
  Terrestrial. By Reeves, (D.) 481
Magnetism for engineers, (D.) 481
Magnetization, Time log of. By Holborn, (D.) 625
Magnetization curves in weak fields. By Holborn, (D.) 625
Magnetization limit of wrought iron. By Wilde, (D.) 393, 815
Magnetization of needles for static galvanometers. By Pretty, (D.) 852
Magnetograph, (D.) 179
Magnetometric observations. By Du Bois, (D.) 145, 179
Magnetometry, Disturbances in. By Du Bois, (D.) 394
Magnets
  Calculation of wires for. Hanchett, 499
  Eye surgery, (D.) 693
  Gun wound. By King, (D.) 241
  Permanent. By Klemencic, (D.) 783
  Tempering. By Barus, (D.) 661
Manganese, Preparation in electrical furnaces. By Moissan, (D. R.) 179
Marine engines, Prevention of racing in. By Harlan, (D.) 394
Mason damper regulator, 596*
Massachusetts gas and electric light commissioners, Report of, 315
Mast arm, Walls & Co., 786*
Mathematics, Qualitative. By Fessenden, 206; Wolcott, 141, 238
Measurement of coefficients of induction. By Granquist, (D.) 739
Measurements, Pyrometric. By Holborn, (D.) 817
Measuring cable currents during a conductor test. By Christophersen, (D.) 482.
Measuring co-efficients of self-induction, Use of the secohmmeter, (D.) 394
Measuring electrolytic conductivity. By Stroud and Henderson, (D. R.) 209, 362
Measuring frequency of oscillating currents. By Besso, (D.) 626; Meyer, (D.) 268, 329, 692
Measuring instruments
  Classification of electrical. By Campbell, (D.) 512
  Development. By Anthony, (D. R.) 101
  Faults in, (D.) 662
  Long scale, (D.) 72
  Siemens & Halske. By Raps, (D.) 565
  Standardized. By Armagnat, (D.) 209,268, 295, 362, 539, 566, 739
Measuring large electrolytic resistances with continuous current. By Malmstroem, (D.) 817
Mechanical conceptions of electrical phenomena. By Heinke, (D.) 293
Medical College electrical plant, (D.) 26
Mercury, Atomic weight of. By Hardin, (D. R.) 662
Mercury arc. By Arons, (D.) 99
Mercury electrodes, Capacity of polarization of. By Chrlich, (D.) 662
Mercury films, Formation of. By Appleyard, (D.) 738
Metallic alloys, Production of. By Walter, (D.) 482, 661
Metallic hydroxides and sulphides, Production of, (D.) 328, 661
Metals
  Extraction of, (D.) 456; By Schnabel, (D.) 593
    Edison plant, (D.) 482
    Hoepfner process, (D.) 565

Metals
Influence of tension and compression on the thermoelectric and magnetic properties. By Meyer, (D. R.) 661
Production in U. S., 1896, 54
Separating and refining by. electrolysis By Tommasi, (D. R.) 144
Separating by means of soluble anode. By Pauli, (D. R.) 241
Thermo-electric properties of liquid. By Burnie, (D.) 392
Metals and electrolytes, Potential difference between. By Wiedebu: g, (D. R.) 328
Meters
Alternating-current, New. By Hummel, (D. R.) 242
Hoopham, (D.) 209
Penny-in-the-slot. By Gibbings, (D.) 70
Testing, London, (D. R.) 268
Verification of. By O'Keenan, (D.) 738
Metric system in electrical industries. By Hickok, (D. R.) 180
Metropolitan Electric Co., Chic., joist-boring machine, 216*
Mica
Duty on, 784, 819
Tests of, (D.) 663
Microphone, Disc, Stock, (D.) 594
Microphonic telephone action. By Fessenden, (D.) 663
Microphonograph, Dussaud system, (D.) 394
Mineral and metal production, U. S., 1896, (D.) 739
Mining, Electricity in, (D.) 690; By Hale, (D.) 177
Davic Coal & Coke Co. By Sprague, (D.) 207, 360
Jackson Co., Ohio, (D.) 207
Kingston, Pa., 484
Maries coal mines. By Pierard, (D. R.) 509
Moon Run Coal Co., 338
N. Y. & Scranton Coal Co. By Gardner, (D.) 624
Pacific coast. By Perrine, (D.) 590
South Africa, (D.) 265
(See also Hoists.)
Mining lamp, Incandescent, (D.) 537
Mining machines, Electric, Ohio, (D.) 142
Mirror-speaking instruments for use on board ship. By Rymer-Jones, (D.) 179
Molecular conductivity of dilute solutions of salts. By Joubin, (D. R.) 361, 593
Molecules, Magnetic. By Klingenberg, (D.) 783
Molybdenum free from sulphur, (D.) 693
Moon Run Coal Co., Electric plant, 338
Motor rheostat device. By Harrold, (D.) 453
Motor starter, Whittingham. 269*
Motor vehicles, 468; By Hospitalier, (D.) 736; Salomon, (D.) 736
Cabs, in New York, (D.) 392
Calculations. By Fitzgerald, (D.) 25
Columbia, Description of, 608, 614*
Darracq in Paris, (D.) 142, 178
Different types, (D. R.) 240
Krieger system, (D.) 239, (D. R.) 266, 326
Motors
Alternating current
Comparative commercial qualities. By Williams and Perkins, (D.) 479
Ganz system. By Dubsky, (D.) 563
Attached to wall, 269*
Boat, For, 334*
Brake for testing. By Marechal, (D.) 657
Brooklyn Bridge trains, 124*
C. & C. ironclad, 540*
Ceiling, Alaim-Erwards, 333*
Clymer & Heilman, 338*
Combination for operating a vitascope, 337*
Constant speed direct current, Theory of. By Joyce, (D.) 424, 479; Rhodes, (D.) 391
Cost of operating, (D. R.) 325
Designs for small. By Poole, (D. R.) 325, (D.) 563
Dissimilar action of similar machines. By Baxter, Jr., 259
E. M. F. regulation. By Hunter and Leonard, 67*
Factory plants. By Conradson, (D.) 480
Faults in direct current motors, (D.) 563
Imperial, Stationary armature core, 398*
Induction
Geographical calculation of. By Danielson, (D. R.) 325
Multiphase, Construction of. By Eboral, (D.) 479
Pre-determination of current. By Kuebler, (D.) 99
Iron losses in three-phase. By True, (D.) 479
Non-synchronous. By Behrend, (D.) 509; Kuefler, (D.) 689; Pottier, (D.) 563, 657
Condensers in armatures of. By Guilbert, (D.) 265
Parallel operation test before assembling, (D.) 326
Portable, Card Electric Co., 854*
Printing press operated by direct connected motor, 335*
Protecting devices, Tests, 756
Railway. By Ziffer, (D.) 177
General electric, 485*
Improvements in, 270*
Repair of, (D.) 564
Speed regulation. By Baxter, Jr., 477, 503, 535
Test, Before working in parallel, (D.) 326
Testing field coils without use of instruments. By Porter, 496, 498*; (D. R.) 782
Three-phase, 640, 642
Transforming into shunt motor, (D. R.) 453
Regulartor for series, Thury system, (D.) 24
Repair of. By Shepard, (D.) 178
Rudder operation, (D.) 453
Motors, Shunt
Comparison with series. By Luxenberg, (D.) 735
Compounding for constant speed at all loads. By Hutchinson, (D.) 177
Measuring efficiency without a dynamometer. By McKissick, (D. R.) 179
Traction purposes. By Engelhardt, (D.) 814
Single-phase. By Berg, (D.) 849
No. Elec. Mfg. Co., 107
Tri-phase. By Georges, (D. R.) 657
Speed control for. By Anthony, (D.) 537; Blood, (D.) 265, 479
Starting resistances for. By Pochin, 657
Synchronous, Effect on power factor of three-phase installations. By Klasson, (D.) 736
Tesla, Test of. By Place, (D.) 780
Three-phase, With variable number of poles. By Dahlander, (D.) 689
Triumph Electric Co., 785*
Mouthpiece for speaking-tube, Electrically illuminated, 146*
Municipal insurance. By Pearson, (D. R.) 240
Municipal ownership
Central stations, (D.) 293. By Francisco, 703, 707; Thayer, (D.) 454; Winchester, (D.) 361
Electric railways, (D.) 564
Huddersfield. By Pogson, (D.) 591
Murdock lamp cord adjuster, 334*
Muscles, Effect of continuous currents upon. By Weiss, (D.) 784

N

National Academy of Sciences, Washington Meeting, 561
National Association of Manufactures, Convention, 162
National Electric Light Association
Niagara Falls convention, 308, 556, 642, 703
Exhibits, 809*
Notes, 773, 774
Proceedings, 683, 769
Report, Committee on Data, 754
Officers, New, 774*
Pres. Nicholls' report, 350
National Fire Underwriters, Electrical Bureau of, (D. R.) 482
National Tube Works Co., 298
Naval life, Electricity in. By Fiske, (D. R.) 102, 180, 210
Budapest underground, 564, (D.) 292; By
New York Academy of Sciences, Reception, 470
New York Accumulator & Electric Co., Batteries, 515*
New York & Ohio Co., Transformers, 337*
New York Edison Co., Report, (D. R.) 293
New York Electrical Society, Annual meeting, 678
New York Fire Department, Requirements regarding magnetic motor protecting devices, 213*
New York Stock Exchange, Wiring of, 243*
Newspaper presentation of engineering matters, 440
Newton cut-outs and switches, 484*
Niagara Electro-Chemical Works, 733*
Niagara Falls & Lewiston Railway, 725*
Niagara Falls-Buffalo transmission line, 724*. By White, 801
Celebration at Buffalo, 83, 85, 103*
Niagara Falls Hydraulic Power & Mfg. Co., 730*
Niagara Falls Power Co., 721*
Niagara power
Local distribution, (D. R.) 267
North Tonawanda factory supplied with current, 183
Utilization of, (D.) 99
Nicholls' report to National Electric Light Association, 350
Nickel, Tortion of. By Cantone, (D.) 783
Nitric acid, Electrolysis of, Formation of Ammonia, (D.) 426
Nobel's bequests to science, 159, 162
Northern Electric Mfg. Co., Slow speed motors, 107
Northwestern Electrical Association, 83, 96, 115
Convention
Exhibits, 182
Report, 136
Nowotny arc lamps, 631*

O

Ocean depths, (D. R.) 627
Ohio Brass Co.
Feed wire splicer, 595*
Trolley wire hanger, 459*, 515*
Ohms, B. A., compared with mercury standards. By Lindeck, (D.) 241
Oil as an insulator, (D.) 512
Oil filter, Cross, 595*
Onondaga Dynamo Co., Direct connected generating set, 212*, 364*
Optics and the theory of ions. By Zeeman, 555, (D.) 593
Ore separation, Edison plant, (D.) 482
Organic tissues, Continuous currents through. By Weiss, (D.) 784
Orthopaedic Dispensary and Hospital, Roentgen-ray in, 30*
Oscillating currents, Measuring the frequency. By Meyer, (D.) 268, 329
Oscilographs. By Abraham, (D.) 662; Blondel, (D.) 662
Oxidation of sulphides to sulphates. By Durkee, (D.) 72
Oxygen, Liquid
Dielectric constant. By Fleming and Dewar, (D.) 70, 267, (D. R.) 481
Magnetic permeability. By Fleming and Dewar, (D. R.) 71
Ozone. By Shenstone, (D.) 512
Analysis of. By Tommasi, (D.) 539
Production and application of. By Andreoli, (D.) 328, 428, 457, 511, 565; Otto, (D.) 661
Ozonizers, Efficiencies of, (D. R.) 817

P

Packing, Garlock waterproof hydraulic, 297*, 514*
Paintings tested by Roentgen rays, (D.) 625
Palmer gas engines, 819*
Palmieri, Luigi, Biographical notice. By Marcillac, (D. R.) 363
Para pneumatic pulley, 740*
Paraffin, Conductivity, Effect of Roentgen rays. By Kelvin, Beattie and Smolen, (D.) 178
Paragon arc lamps, 483*, 629*
Paris Exposition of 1900, 263, (D. R.) 296, 363
Patent convention with Japan, 378
Patent laws, Proposed changes, 116
Patent Office rules revived, 837
Patents, Electrical
English, of 1883, (D.) 102
Inventions of past 20 years. By Townsend, (D. R.) 180
Peat, Converting into coal, (D.) 594
Percarbonates, Electrolytic preparation of, (D. R.) 427
Peroxide of lead, Making. By Warren, (D.) 179
Persulphuric acid, Formation of. By Elbs and Schoenherr, (D. R.) 71
Peru cut-outs, 596*, 629*, 666*
Pettingell-Andrews cut-outs, 541*
Phase difference, Apparatus for illustrating. By Derr, (D.) 101, (D. R.) 145
Philadelphia Traction Co.'s Mt. Vernon street station, Destruction of, 348, 356*
Philadelphia water tube safety boiler, 330*
Photographic photometer. By Simon, (D.) 101
Photography, Submarine, by electric light. By Cleaves, (D.) 102
Photometer
Photographic. By Simon, (D.) 101
Universal. By Blondel and Broca, (D.) 209
Photometric quantities. By Feldmann, (D. R.) 179
Photometry
Mirrors with paraffine lamp and scale. By Hoffert, (D.) 329
Platinum standard. By Violle, (D.) 242
Units, (D.) 816; By Blondel, (D. R.) 29; Weber, (D.) 328
Photometry in the industries, (D.) 512
Phyllopera, Destruction of by ozone, (D.) 210
Pittsburg Reduction Co., 731*
Plants, Effect of electricity on. By Narkewitsch-Jodko, (D.) 102; (D. R.) 268, 428
Platinum
Production in Russia (D.) 692
Supply and consumption of. By Baker, (D. R.) 482
Standard. By Violle, (D.) 783
Ploughs, Electric, (D.) 25, (D. R.) 69, 689
Plumb, Berdict & Bernard, Electric power in factory, 183*
Polarization
Capacity of, Determining. By Gordon. (D. R.) 72, 817
Electric ray, Of the. By Bose, (D. R.) 267
Rotary magnetic. By Van Aubel, (D. R.) 511
Theory of current following. By Salomon, (D.) 71
Polarization and internal resistance of a galvanic cell. By Moore and Carpenter, (D.) 71
Polarizing substances, Electric conductivity of. By Bose
Pole finder, (D.) 739
Pole-finding papers, (D.) 180
Poles, Trolley. By Perrine, (D. R.) 782
Distance between for overhead lines, (D.) 592
Protective device. By Sonneberg, (D.) 625
Portable Electric Drill Co., Drills, 430*
Potassium percarbonate. By Von Hansen, (D.) 661
Potential difference between metals and electrolytes. By Wiedeburg, (D. R.) 328
Potentiometer. By Franke, (D.) 852
Power. (See Central Stations; Isolated plants; Transmission plants.)
Pressure gauges, High vacuum. By Sutherland, (D.) 267
Printing press operated by direct connected motor, 335*
Printing telegraphy, 854*
Hoffman system, (D.) 242
Roland, (D.) 145
Prismatic electric sign, 791*
Prizes for the advancement of science, 159, 162
Projectors. By Pretty, (D.) 325, 391, 453
Candle-power, Method of finding, (D.) 566
Coast defense. By Boyd, (D.) 265, (D. R.) 480
Electric arc for. By Hopkins, (D. R.) 25
Examining bottom of sea with, (D.) 692, 780
General Electric Co. (D.) 325
Rushmore, 693*
Pulleys
Cresson loose, 567*
Para pneumatic, 740*
Pullman's centre vestibule double-deck car, 298*
Pumping stations, Electric. By Maltby, (D.) 658
Combined pumping and lighting plant. By Sykes, (D.) 814
New Orleans, (D.) 480
Pumps, Electric, 742*
Automatic controller for. By Oppenheim, (D.) 689
Boiler-feeding, 431*
High speed, (D.) 658
Siemens & Halske, (D. R.) 265

Punching press, Bliss geared, 216*
Puritan arc lamp, 36*, 105*
Push button switch, Marshall porcelain, 399*
Pyrometer, An electro. By Bohm, 306*
Pyrometric measurements. By Holborn, (D.) 817

Q

Quaker City Electric Co., Direct-current machines, 513*
Qualitative mathematics. By Fessenden, 206; Wolcott, 141, 238
Quarry, Electric lighting of, 695
Quartz fibres. By Boys, (D.) 29
Queen & Co.
  Portable testing set, 395*
  Roentgen-ray apparatus, 788*

R

Radiation. By Dorman, (D. R.) 208, 362; Lodge, (D.) 392
  Electric properties of, produced by the action of light. By Le Bou, (D.) 737
  Optical and electrical, Connection between. By Puluj, (D.) 240
  Zeeman's discovery, 408, 552, 555, 556, (D.) 327, 392, 426
Radiographs. (See Roentgen rays.)
Rail connections. By Hoefer, (D.) 510
Railroad Commissioners, New York State, Report, 84, 98
Rails, Continuous, (D.) 69
  History. By Raymond, (D. R.) 207
Railway appliances, Recent development in. By Baylor, (D.) 591, 624; Grove, (D.) 658
Railway Master Mechanics' Association, Electrical features, 812
Railway signaling. (See Signaling.)
Railway Telegraph Superintendents, Convention of, 836
Railways, Electric. By Perry, (D.) 480
  Accumulators. By Baxter, 62*, 91*; Hewitt, 204, 237, 240; Rasch and Birnbaum, (D.) 425; Ziffer, (D.) 25
    English practice, (D.) 564
    Germany, (D.) 814; By Korda, (D.) 325; Schroeder, (D.) 142
    Hanover, Mixed system, (D.) 624, 850; By Ross, (D.) 537
    Mixed system, (D.) 590
    Ostende, Proposed, (D.) 425
    Paris, (D. R.) 850; By Soulier, (D.) 658
    Rapid charging. By Blanchon, (D.) 511; Epstein, (D.) 565
    Tests with. By Sieg, (D.) 510
  Austria-Hungary, 1896, (D.) 690
  Berlin, Conduit system, (D. R.) 510
  Bilbao, Spain, (D. R.) 266
  Birmingham, Conduit system proposed, 536.
  Brooklyn Bridge, 119*
  Brussels, Conduit system, (D.) 624; By Pierard, (D.) 266
    Montier, (D. R.) 360, 510
  Chalons-sur-Marne, Side trolley system, (D.) 292
  Chicago, Love conduit system, D. R.) 293
  Chicago Suburban Co., (D. R.) 591
  Claret-Vuilleumier system, Paris, 143
  Columbia and Maryland. By Huff, (D.) 425
  Conduit system
    Brussels. By Pierard, (D.) 266
    Chicago, South Side, (D. R.) 293
    Cirla system, (D.) 69
    England, New, 147
    K. A. K., Springfield, O., (D. R.) 736
    Lachmann, in Hamburg, (D.) 391, 658, 690
    Love system, Advantages. By Laaw, (D.) 143
    Megroz and Stork system, (D.) 781
    New York, (D.) 143
    Simplex, (D.) 425
    Success of, 308
  Conn., Operating expenses., 1896, (D. R.) 293
  Construction. By Chance, (D. R.) 782
  Cost
    Generation of energy. By Raworth, (D.) 624
    Overhead work. By Macartney, (D. R.) 361
    576, 589
  Detroit and Port Huron, Alternating current plant, (D.) 292
  Dickinson system of trolley wire suspension, France, (D.) 292
  Economy in operation. By Davis, (D.) 361
  England, New Conduit system, 147
  Europe
  Davidson's "Lightning coach," in 1840, Descriptions, (D.) 510
    Report on, 322
    Statistics, 1896, (D.) 454
  Feeding, Equilibrium system. By Spagnoletti, (D.) 781
  First, Notes on, 576, 589
  Geneva, (D. R.) 208
  Germany, Statistics, (D.) 177, (D. R.) 392
  Great Britain
    List of, (D. R.) 70
    Statistics, (D.) 207
  Hanover, Mixed trolley and accumulator system, (D.) 624, 850; By Ross, (D.) 537
  Ireland, Progress, 172
  Jungfrau, 254, (D.) 178, 690, 814, (D. R.) 326; By Wuest and Thormann, (D.) 265, 642
  Lachmann conduit system, Hamburg, (D.) 391, 658, 690
  Lacroix surface contact, (D.) 425
  Light, Eaton Hall, (D. R.) 25
  Liverpool and City and So. London Statistics, (D.) 266
  Liverpool overhead, 57, (D. R.) 69, 239
  London
    Overhead, Proposed, (D.) 326
    Underground schemes, 116
Railways, Electric.
  Love system, Advantages of. By Law, (D). 143
  Lugano, Three-phase system, (D.) 239, (D. R.) 207
  Madras, India. By Guy, (D. R.) 100
  Massachusetts
    Distribution of power, (D.) 292
    Statistics, 1896, (D.) 781
  Meckenbeuren-Tettnang, (D. R.) 143
  Milan, (D. R.) 591
  Modern practice. By Baylor, (D.) 538, 564, 591
  Monorail system. By Pierard, (D.) 736.
  Municipal ownership, (D.) 564
    Huddersfield. By Pogson, (D.) 591
  New London, Power house, (D. R.) 207
  New system. By Zehme, (D. R.) 509
  New York
    Conduit system, New, (D.) 143, (D. R.) 591
    Statistics, 1896, (D.) 781
  Niagara Falls & Lewiston, 725*
  Operation of long lines. By Short, (D.) 100
  Paris
    New overhead system. By Bochet, (D.) 392
    Surface contact, (D.) 392, 690
  Pittsburg, New, 72
  Return circuits
    Injurious effects of. By Van Vloten, (D.) 266
    Rules of German girt, (D. R.) 326
  Simplex conduit system, (D.) 425
  Single wire, double track, Henry system, (D.) 70
  Speed on, Philadelphia, 676
  Steep grade
    Mollard and Dulac system, France, (D.) 292
    St. Paul, (D.) 480
  Suburban traffic. By Wallace, (D.) 392
  Surface contact systems
    Claret-Vuilleumier, Paris, (D. R.) 143
    Doty, new system, 789*
    Lacroix, (D.) 425
    Paris, (D.) 392, 690, (D. R.) 143
  Syracuse, Description, (D. R.) 361
  Third rail
    Bonding of. By Yandis, (D.) 814
    Brooklyn Bridge, 119*
  Three wire system. By Baylor, (D.) 591, 624; Grove, (D.) 658
    London, (D.) 480
  Toledo, Ohio, Plant, (D. R.) 100, 207
  Traction diagram. By Tomlinson, (D.) 25
  Transportable, German, (D.) 781
  Trenton, Power station records. By Moore, (D.) 361
  Versailles, (D. R.) 25
  Vienna, (D.) 266, (D. R.) 591
  Walker system, (D. R.) 624
  Washington, Alexandria & Mt. Vernon, (D. R.) 70
Railways, Steam
  Balt. & Ohio
    Electric lighting plant, 284
    Telegraph department, 580
  Cincinnati Southern, Electricity on. By Coles, (D.) 428
  Electric traction. By Brangs, 835; Davis, (D.) 624, 782; Henry, (D.) 100; Higgins, 495, 507; Marchena, (D.) 25
    Balt. & Ohio. By Fitzgerald, (D. R.) 100
    Belgium. By Pierard, (D.) 360
    California, (D.) 207
    Cripple Creek, proposed. By Henry, (D.) 782
    Nantasket Beach line. By Clark, (D.) 425
    N. Y., N. H. & H., 280, 282, 619*, 675; By Heft, (D.) 782
    Requirements for high speed and heavy traction, 551, 553*
  N. O. & W., Electric power at New Orleans terminal. By Smith, 440, 443*
Rapid transit act, New York, declared constitutional, 418
Rays
  Becquerel; (D.) 179, 455, 510
  Black, New kind of. By Frederich, (P. R.) 426, (D.) 691
  Discharge. By Hoffmann, (D.) 455
  (See also Cathode rays; Roentgen rays.)
Reactance. By Houston and Kennelly, 686
Rechard turbine water wheel, 791*
Recorder, Syphon, Kelvin system, (D. R.) 210
Recording meter, Autographic. By Hering, 617*
Reflectors, Frink, 741*, 786*
Regulators
  Alternating current, (D.) 26
  Electric, for dynamos, 787*
Reichsanstalt, Work of the, (D.) 425
Residual discharges, Theory of. By Houllevigne, (D.) 455
Resistance
  Conductor resistance met by alternating currents. By Jackson, 90
  Dielectric. By Appleyard, (D.) 782; Drude, (D. R.) 782
  Discharges in derived circuits. By Cardani, (D.) 178
  Insulation, Measurement on three wire systems. By Houston & Kennelly, 309
  Measurement of. By Armagnat, (D. R.) 566, 662; Beinhorn, (D.) 29; Kohlrausch, (D. R.) 29
  Virtual, in alternating current work. By Taylor, (D.) 782
Resistance boxes
  Callendar-Griffiths. By Clark, (D.) 512
  Discussion of. By Clark, (D.) 179
Resistance coils for telephonic experiments, (D.) 180
Resistance of electrolytes. Measurement of By Wien, (D.) 427
Resistance of the electrical arc. By Frith & Rodgers, (D. R.) 207
Resistance of the human body, (D.) 739; By Hedley, (D.) 788; Soehi & Sano, (D.) 103
Resistance of wires, Influence of vibration on. By Murani, (D. R.) 426
Resistance standards, (D.) 662
  Comparison of. By Lindeck, (D.) 783
Resonance
  Discussion. By Feldman, (D.) 326, 361
  Multiple, (D.) 815
  Practical aspects of. By Miller, (D.) 393
  Researches. By Heinke, (D.) 293
Review of 1896 electrical progress, 3; By Armstrong, (D. R.) 180
Reynolds insulating "bug," 146*
Rheostats. By Kohlrausch, (D.) 512
  Construction and calculation of. By Heidt, (D.) 453
  "D. L." automatic, 595*
  Elevator control, 695*
  Enamel, New types, 399*
  Mueller system, (D.) 268
  Multiple, Ridlou, 36*
  Water, Bertin-Sans, (D.) 594
Ridlon multiple rheostat, 36*
Robinson porcelain bushing, 567*
Roch, John A., Biography, (D. R.) 180
Roebling's Sons Co., Wire Works, 513*
Roller bearings for traction. By Marshall, (D.), 781
Roentgen ray apparatus. By Willyoung and Saven, (D.) 209, 241; (D. R.) 362
  Baillard, 73*
  Fessenden Mfg. Co., 514*
  Induction coils. By Norton and Lawrence, (D.) 481
    Portable, 597*
  Knott Co., 541*
  Manipulation of. By Hanchett, 377*
  Queen & Co., 788*
  Static machines, 396*; by Frei (D.) 27, 101; Welbourn (D.), 456
  Swett & Lewis, 629*
  Tesla coil. By Remy, (D.) 481
  Tubes. By Woodward, (D.) 738
    Adjustable. By Swinton, (D.) 737
    Discharge of, effect of fluorescent substance on, 688
    Double tubes. By Courmelles and Seguy, (D.) 660
    Electrostatic discharge. By Dell, 767
    Experiments. By Korda, (D.) 737
    German, with two cathodes, 741*
    Improvement in. By Berlinger, (D.) 327
    Large size, 694*
    Life, Method of prolonging. By Osterberg, (D.) 267
    Motion in. By Peckham, (D.) 27
    Photographic candle power. By Trouton, (D.) 455
    Regulation of. By Walter, (D.) 178
    Sayen, with adjustable vacuum, 578*
    Self-regulating, 788
    Short exposure. By Colardeau, (D.) 539
    Siemens & Halske, (D.) 327
    Suggestions for. By Spencer, (D.) 481
    Swinton adjustable focus tubes, 577*
    Temperature in, Determining. By Wood, (D. R.) 72
    Types of, (D. R.) 71
    Unipolar. By Pflueger, (D.) 783
Roentgen ray myths. By Thompson, (D. R.) 26
Roentgen rays, (D.), 208. By De Heen, (D.) 538; Hering, (D.) 393; Houston and Kennelly, (D.) 294; Loth, (D.), 100; Peckham (D.) 327; Roiti, (D. R.) 100; Salamons, (D.) 208; Sella and Majorana, (D.) 208; Tesla, (D.) 539; Thomson, (D.) 100; Threfall and Pollock, (D. R.) 267; Turner, (D.) 294; Van Aubel, (D. R.) 26
  Absorption by crystallized material. By Agafonoff, (D.) 783
  Bacteria and. By Blaikie, (D.) 815
  Beam of light, effect upon. By Woodward, 829*
  Biological action of. By Capranica, (D.) 815
  Blindness and. By Barr, (D. R.) 144; Robertson, (D.) 71; Walker, (D.) 100
  Burns from, (D.) 267; By Reid, (D.) 327; Thomson, (D.) 539
  Cathode rays (See Cathode rays.)
  Cause of. By Thomson, 829
  Chemical action of. By Hemptinne, (D. R.) 327
  Consumption and. By Bouchard, (D.) 178.
  Crucial experiments. By Voller and Walter, (D.) 815
    Wood, (D.) 511
  Defraction of. By Tiddens, (D.) 815; Wood, (D.) 511
  Discharge by. By Perrin, (D. R.) 26, 455
  Energy of. By Trowbridge, (D.) 455
  Evolution of. By Cornu, (D. R.) 144, 362
  Exposure time. By Levy, (D.) 782; Willyoung. (D. R.) 328
  Fluorescence By Radiguet, (D.) 267
  Fluorescent screens, Power of. By Salvioni, (D. R.) 426
  Fluorescing salts. By Edison, (D. R.) 101; Kolle, (D.) 267
  Generation of. By Langer, (D.) 815; Wood, (D.) 511, 593
  Glass and enamels made luminous by. By Radiguet, (D.) 455
  Hair, Effect upon the. By Kolle, (D.) 293
  Harmless, when generated with static machines. By Frei, (D.) 27, 101, 241
  Heart diseases and. By Leguy and Oueeniset, (D.) 660; Thompson, (D. R.) 71
  Injurious effects of. By Tesla, (D.) 626; Kolle, (D.) 691
  Lenard rays. By Thompson, (D.) 327
  Medical application of. 30*. By Stine. 11
  Medicinal properties. By Caffrey and Wilson, 67

Roentgen rays
- Microbes, Action on. By Sarrazes and Riviere, (D.) 815
- Microscopic photography by means of. By Heycock, (D.) 592
- Opacity, Law of. By Marangoin, (D.) 179
- Paintings tested by, (D.) 625
- Penetrative powers. By Swinton, (D.) 625
- Penumbral illusions. By Sagnac, (D. R.) 267
- Photographic action. By Batelli, (D.) 294, 660; Colson, (D.) 815; Donati, (D.) 426; Vandergoer, (D.) 293, 592
- Photography. By MacIntyre, (D.) 71; Morton, (D.) 691
- Physiological effects. By Hawks, (D.) 267; Thomson, (D.) 101
- Radiographs
  - Arm with three hands, (D.) 328
  - Arterial circulation, (D. R.) 209
  - Bone graft. By Dunlap, (D.) 565
  - Diagnosing rheumatism and gout. By Sirbanesco, (D.) 327
  - Soft parts of the body. By Remy and Coutremoulin, (D.) 455
- Refraction and diffraction, Wright's experiments, 561, (D.) 691
- Steam jet, Effect upon. By Richarz, (D.) 539
- Therapeutics of, (D.) 593
- Thermo-luminescence by X-rays. By Borgman, (D.) 737
- Thorax examined by raidoscope. By Bouchard, (D.) 267
- Transparency of bodies to. By Van Aubel, (D.) 481; Benoist, (D. R.) 481
- Velocity of. By Lussana and Cinelli, (D.) 26
- Vienna investigations, 175
- Visibility of. By Brandes and Dorn, (D.) 481, (D. R.) 737
- Vision, Action on. By Kolle, (D.) 362
- Voltage required for, 322
- Water vapor decomposed. By Richarz, (D.) 426

Rotation in constant electric fields. By Quincke, (D.) 327, (D. R.) 393
Roth fan motors, 513*
Rithen, Dr. Timothee, Biographical sketch, (D. R.) 330
Rothschild shirt factory, Trenton, N. J., 500*
Rubber, Hara, Restoring original color, (D.) 663
Rubber, Exports of Nicaragua, 162
Rudder motor, (D.) 453
Rudder steering machine, Esberger system, (D. R.) 268
Rules for electrical installations, 756
- Germany, (D. R.) 100, 538
- Switzerland, (D.) 815

Rumsey electric boiler-feeding pump, 431*

S

Safe-breaking by electricity, (D.) 663; Kammeyer, (D.) 394; Mailloux, (D.) 483; Noe, (D.) 566; Roaman, (D.) 210, 363, 482; Summers, (D.) 817
St. Paul Building, N. Y., electric plant, 411*
Salts
- Electrolytic conductivity. By Fritsch, (D.) 426, 593
- Law of thermic constants. By Tommasi, (D.) 816

Santa Claus visits Ottawa in an electric car, 73*
Saw mill, First operated by electricity, 108
Science associations at Detroit, 282
Search lights. (See Projectors.)
Secohmeter, Use of, (D.) 394, 512
Seeds, Effect of electricity on, (D.) 394
Seismograph at the U. S. Weather Bureau. By Hopkins, (D.) 72
Selenium, Resistance of. By Majorana, (D. R.) 240
Self-induction, Measuring co-efficients, Use of sechometer, (D.) 394, 512
Self-induction standards. By Wien, (D.) 295
Separator, Magnetic, Wetherill, (D. R.) 482
Shafting vs. electricity in a machine shop. By Benjamin, (D.) 781
Shelby incandescent lamp, 215*
Ship building, Electric power in. By Kodolitsch, (D.) 658
Shops. (See Factories.)
Siemens & Halske Co. and Penn Iron Works Co., Reported consolidation, 837
Sign, Prismatic electric, 791*
Signalling, Railway
- Block system. By Boult, (D.) 101, 180, (D. R.) 242; Pigg, (D. R.) 29
- North London Ry. By Ferreira, (D.) 692
- Interlocking, Electric, (D.) 180; By Hollins, (D.) 268, (D. R.) 427, 594
- Street railways, N. Y. City, (D. R.) 102

Silicates, Formation of. By Mayencon, (D.) 28
Silichrometer, a product of the electric furnace, (D.) 145
Sine curves in alternating current problems. By Rhodes, (D.) 100
Sioux City Corliss engines, 333*
Skin effect of conductors, 84; By Jackson, 90
Smelting in the electrical furnace. By Heibling, (D.) 594
Societe Internationale des Electriciens, Meeting, 124
Sockets. (See Incandescent lamp sockets.)
Sodium, Electrical manufacture of, 733*
Sodium spectral lines, Broadening of, by intense magnetic fields. By Dunstan, Rice and Kraus, 556*; Zeeman, 555
Solder pot, Electric, 430*
"Something new under the sun," 212
South America, Electrical works in, (D. R.) 102, 180
Spark gaps
- Effect of Roentgen rays on. By Guggenheimer, (D.) 455
- Resistance of, Measurement. By Trowbridge, (D.) 593

Sparking commutators. By Hall, (D.) 563
- Design of direct-current dynamos. By Fischer-Hinnen, 386*, 419, 446

Sparks
- Magnetic field, In. By Mastricchi, (D.) 240
- Zig-zag forms of long. By Mouckman, (D.) 240

Speed-reducing device for electrical machines, 743*
Splicer, Feed wire, 595*
Stage effects with electricity, (D. R.) 739
Stanley Electric Co., Ground Detector, 269*
Star Electric bicycle lamp, 337*
Static machine for Roentgen ray work, 396*; By Frie, (D.) 27, 101; Welbourn, (D.) 456
Stealing electricity, 752; By Ostwald, (D.) 692
Steam engine governor for electrical work. By Taylor, (D. R.) 177
Steam engine indicator, Crosby, 667*
Steam engines. (See Engines.)
Steam generator, Hascall, 666*
Steam jet, Action of Roentgen rays on. By Richarz, (D. R.) 209
Steam saver, Heintz, 785*
Steam separator, Cochrane, for horizontal pipes, 484*
Steamers
- Cable, Portena, (D. R.) 512
- Electric lighting of, (D. R.) 26; By Bernard, (D.) 424
- Essberger steering system, (D. R.) 268

Steel
- Heat treatment of hardened, Influence upon magnetic properties, 409
- Magnetization by Leyden jar discharges By Veillon, (D.) 511

Steel and iron, Magnetic properties of Austrian. By Egger, (D.) 510
Steroscopic radiography. By Marie and Ribaut, (D.) 660
Sterling Cedar poles 74*
Stevens Institute of Technology, Anniversary celebration, 279; 287
Stoker, Mechanical, Wilkinson Mfg. Co., 36*
Stomach, Electrization of. By Einhorn, (D.) 180
Street car fares in Indianapolis, Legal decision, 552, 761, 800, 808
Street lighting
- Arc lamps for. By Hesketh, (D.) 563
- Incandescent lamps, England, 381

Street railway signaling system, New York, (D. R.) 102
Street railways
- American, British impression of. By McCallum, (D. R.) 70
- Cost per mile or per passenger, (D. R.) 690
- Europe. By Ziffer, (D. R.) 70
  - Comparison with U. S. By Sullivan, (D.) 591
- Financial practice and engineering methods of American, 495, 507
- Mass., 1896 report, 447
- New York
  - Aims system proposed, (D.) 69
  - City ownership of, 440
  - Electric traction on, 639
  - Underground trolley system, 407
- New York state, Commissioner's report, 84, 98
- Paris. By Hillairet, (D. R.) 25, 239; Lavalard, (D. R.) 70
- Track construction. By Camp, (D. R.) 480
- (See also Railways, Electric.)

Studebaker tower wagon, 597*
Submarine boat, Holland system, (D.) 690
Submarine cables
- Alternating currents in concentric conductors. By Price, (D.) 566
- Atlantic, New, 450
- Amazon cable. (D. R.) 210
- Construction of. By Brylinskie, (D.) 210
- Disturbance by electric railway. By Trotter (D.) 784
- Induction in multiple core cables. By Dressing, (D.) 242
- Insulation of. By Bright, (D.) 626; Houston and Kennelly 421
- Laying of. Rapid work. By Crutchley and Snell, (D.) 692, 784
- Localizing faults in. By Rymer-Jones, (D.) 101
- Pacific cable. By Sullivan, (D.) 268; Taylor, (D.) 210
- Persian Gulf, 1864. By Webb, (D. R.) 102
- Raising a buoyed cable end. By Taylor, (D.) 394, 512
- Repairing. By Benest, (D.) 456, (D. R.) 540
- Telephone. By Pierard, (D.) 539

Submarine telegraphy. By Mance, (D. R.) 540; Wingfield, (D.) 692, 784
- History. By Mance, 191; (D.) 179
- Progress in. By Ward, (D.) 102
- Rapid. By Dearlove, (D.) 394, Rymer-Jones, (D.) 394, Thompson, (D.) 242
- Sixty years of. By Ayrton, (D.) 329

Submarine earthquakes. By Milne, (D.) 329
Submarine electrical conduit, 805*
Subways, Electric
- Baltimore, (D.) 144, 208
- Boston, Explosion, 375
- Brooklyn, (D. R.) 70
- Developments of. By Maver, Jr., 159, 163*
- Methods of construction. By Maver, Jr., 715*, 766*, 803*

Sugar from cornstalks, (D.) 457
Sugar purification, (D. R.) 328; By Baudry, (D.) 456, 661; Urbain, (D.) 783
- Russia, (D.) 241

Sulphides
- Electrolytic treatment of. By Ashcroft, (D.) 626
- Production of metallic. By Lorenz, (D.) 144
- Siemens process, (D.) 101

Sulphur, Decomposition of. By Gross, (D.)
Sun, electric radiations from. By De Heen, (D. R.) 783; Wilsing and Scheiner, (D.) 660
Suspension apparatus for delicate instruments, Rogers Laboratory. By Laws, 86*
Swett & Lewis Roentgen ray outfit, 629*
Swinging crosses and grounds, Locating. By Gingrich, (D.) 295
Switchboard drop, Lewis, 740
Switchboard panels, Small, 271*
Switchboards
- Alternating-current. By Andrews, (D.) 266, 293
- Construction, for central stations. By Herrick, 831*
- Evolution of. By Davis, (D. R.) 144
- Limit of the standard. By Pierard, (D.) 739
- (See also Telephone switchboards.)

Switches
- Hartford, 364*
- Incandescent lamp control, (D.) 480
- Instantaneous "make and break," 568*
- Linton & Southwick, 515*
- Newton, 484*
- Push-button, "New England," 695*
- Snap, Hart & Hegeman, 428*
- Western Electric, 35*

Synchronograph, By Crehore and Squier, 585*

T

Taber & Mayer desk telephone, 333*, 567*
Tachometers, electric, on warships, 536
Tariff, Dingley bill, and the electrical trades, 376, 383
Technical Journal, The, and the inventor. By Davis, 688; Scheible, 640, 641, 768
Telegraph and telephone poles, (D.) 208; By Petersen, (D. R.) 268
Telegraph Conference, International, (D. R.) 72
Telegraph lines, Length of all in the world, (D.) 268
Telegraph poles, Preparation of, (D.) 510
Telegraphy
- Accumulators in. By Barnett, (D.) 457; Montpelier, (D.) 191, 210, 329
  - New Orleans plant. By Gardanier, (D.) 296
- Auxiliary. By Kitsee, (D.) 180
- Brazilian system, (D.) 394
- Developments in. By Maver, (D. R.) 102
- Duplex system. By Pohl, (D.) 739
- Europe, Statistics, 1895, (D.) 29
- Field telegraphs with the Chitral relief force in 1895. By Dempster, (D. R.) 268
- Military, in Arizona, (D. R.) 102
- Morse code. By Humstone, (D.) 566
- Printing, 854*
  - Hoffman system, (D.) 242
  - Roland, (D.) 145
- Progress in American. By Jones, 16, 176
- Railway disturbances, Rules of German gov't, (D. R.) 326
- Rapid machine methods. By Crehore & Squier, 576, 585
- Spain, 348
- Speed, Unit for Measuring. By Raymond-Barker, (D.) 566, 594
- Speed tests, (D.) 663; By Camp, (D.) 145
  - Belgium, 692
- Statistics, 1895, (D. R.) 692
- Submarine. (See Submarine telegraphy.)
- Switzerland, Statistics, (D.) 739
- Testing. By Young, (D.) 626

Telegraphy and telephony, Simultaneous. By Finn, (D.) 428
Telegraphy without wires, 310, 322, By Preece, (D.) 72
- Marconi system, 834*, (D.) 427, 739
- Tesla experiments, (D.) 817

Telephone bells, Williams-Abbott, 744*
Telephone cables, Submarine. By Pierard, (D.) 539
Telephone charges in Germany, (D.) 295
Telephone commutator. By Biegler, (D. R.) 242
Telephone competition. By De Land, (D.) 210
Telephone convention. (See Independent Telephone Companies.)
Telephone conversation as evidence, Indiana, 529
Telephone installations. By West, (D.) 739
Telephone lines, Mutual action of. By Wilke, (D.) 72
Telephone meters, (D. R.) 784
Telephone practice, American. By Miller, (D. R.) 663
Telephone rates. By Bethell, (D. R.) 540
Telephone receiver, Principles of. By Miller, (D.) 29
Telephone relays, (D. R.) 29
- Polarized vs. non-polarized for single circuits. By Finn, (D. R.) 594

Telephone repeaters. By Patten, 647*, 681*, 704, 710*
Telephone switchboards
- Bailey two-point, 786*
- Horizontal. By Zweitusch, (D.) 817
- Maximum capacity. By Pierard, (D.) 268
- Mianus, 820*
- Worcester, Mass., (D.) 594

Telephone toll lines. By De Laud, (D.) 296
Telephone transmitters. By Weitlisbach, (D. R.) 296
- Battery, Theory. By Miller, (D.) 180
- Magneto and battery, Difference. By Dunbar, 19*
- Microphonic action. By Berliner, (D.) 456

Telephone wires, Vertical crossings of. By Pierard, (D.) 566
Telephones
- Calling apparatus, Various forms. By Miller, (D.) 566
- Electrical Supply & Telephone Co., 34*
- Excursions of the diaphragm. By Barus, (D.) 329

Telephones
Garl Electric Co., 486*
Invention by Manzetti, (D.) 362
McEvoy specialties, 430*
Making, Instruction for. By Clement, (D. R.) 457
New, (D. R.) 210
Nickel stress. By Garrett, (D.) 566
Origin of, (D.) 817
Party line, (D. R.) 210
Stromberg-Carlson, 743*
Taber & Mayer, 333*, 567*
Whitman & Couch, 457*
Telephony. By Weitlisbach, (D.) 210, 296, 482
Absterdam magnetic system, (D.) 739
American practice. By Miller; (D.) 180, 329
Austria, Statistics, (D. R.) 627
Bell telephone business in the West, (D. R.) 210
Berliner case. (See Berliner patent.)
Brusssels, Trunk line experiment. By Pierart, (D.) 29, 180, 295
Chicago station. By Kammeyer, (D. R.) 594
Christiania, new station. By West, (D.) 566
Cost of constructing and operating plant, (D.) 784
Development. By West, (D.) 295, 329
Germany
Charges, Reduction in, (D.) 295
Status of, 203
Great Britain, Trunk line system. By Gavey, (D. R.) 268, 540, 594
History. By Jones, (D. R.) 268, 329
Indian interests, 135, 264
Long distance
Limitations. By Dunbar, 58*
Therrell system, (D.) 540
Microphone resistance, Cause of change. By Fessenden, (D.) 329
Multiplex. By Dunbar, 59*
Railway disturbances. By Muench and Pierard, (D.) 362
Richmond, Va., system, 87*
St. Joseph, Mo. By De Laud, (D. R.) 296
Savannah, New building, (D. R.) 145
Signals given without battery at subscriber's end. By Ritter, (D.) 329, 363, 427. (See Call)
Skin as a telephone receiver. By McKendrick, (D.) 817
Speed tests, (D.) 663
Stockholm system, (D.) 394
Submarine. By Mance, (D.) 210
Edison's opinion, (D.) 145
Switzerland, Statistics, (D.) 739
System without central station. By Pierard, (D.) 427, 627
Trunk line connections for independent exchanges, 807
U. S., Service in, 536
Watson patents, Legal decision, (D. R.) 428
Wurtemburg, (D. R.) 817
Temperature
Measurements of. By Clark, (D.) 72, 179, 512
Regulation by electricity, 146
Temperature coefficient, Measuring. By Towl, (D.) 626
Temperature corrections for dielectric resistance. By Appleyard, (D.) 782
Tennessee exposition, 252, 580
Tesla experiments. By Vincentini and Packer, (D.) 101
Tesla's address at Buffalo, (D.) 210
Testing sets
Queen portable, 395*
Whitney portable, 819*
Texas Gas and Electric Light Association, 381, 497
Texas Street Railway Association, March meeting, 445
Theatre lighting, Glasgow, (D. R.) 590
Theatre lighting controllers, (D.) 292
Theft of electric current, 752; By Ostwald, (D.) 692
Thermic wlt. and ampere meters. By Dujon, (D.) 295
Thermo-electric currents in molten metal. By Backhmetieff and Stambolieff, (D.) 294, 426
Thermo-electric generator, Cox, 630*
Thermo-electric properties of liquid metals. By Burnie, (D.) 392
Thermostats
Coal pockets equipped with, 147
Crompton, for regulation of temperature in rooms, 146
Three-wire systems. By Crocker, 126, 167, 197
Improvements. By Hibbard, (D.) 782
Leakage in. By Kempelhuber, (D.) 782
Thresher direct connected motor, 335*
Tiffany factory, Forest Hill, Electric power, 469*
Time lag of magnetization. By Holborn, (D.) 625
Tools, Electric driven. By Rowan, (D.) 689
Torches
Alcohol, Vallee, 297*
Linemen's, Clayton & Lambert, 339*
Tower wagon, Lamp trimmers' 597*
Track construction. By Camp, (D. R.) 480
Transformers
Alioth system, (D. R.) 813
Arc lamp, Mordey system, (D.) 239
Calculation of. By Dommerque, (D.) 623
Cautery, for hospital work, 367*
Connections, (D. R.) 591
Continuous-current transformer system, (D.) 144.
Core losses, 106
Direct current. By Crocker, 261*; Thordarson, (D.) 735
Faults in. (D. R.) 177
Ferranti effect of. By Grassi, (D.) 361
Formulas for. By Russell (D.) 479, 563; Sumpner (D.) 509; (D. R.) 623
General Electric. Type H, 789*
Transformers
Iron for cores. By Clinker, (D.) 391
Natural draft, General electric, 105*
New type, New York & Ohio Co., 337*
Protective devices for. By Wirt, 133*
Regulation of. By Bijur, 416
Rotary, Principles of. By Berg, (D.) 325; Woodbridge, 415
Rotating liquid. By Carhart, (D.) 563
Scotch system. By Rodet, (D.) 813
Two-phase rotary at Geneva, (D.) 142
Transmission by gas and electricity, Comparative economy of, (D.) 690
Transmission, Electric, (D.) 780
Continuous current series system. By Hecht, (D.) 453, 509
Economics of. By Bell, (D.) 850; Warren, (D.) 480
Equalizer system. By Churchward, (D.) 26
Insulating medium surrounding a conductor the real path of its current. By Houston and Kennelly, 421*
Local distribution in workshops. By Scott, (D. R.) 99; (D.) 564, 689
Long distance. By Esson, (D.) 480, 509, 537; Nicholls, (D.) 590; Steinmetz, (D.) 99
Three-phase line, Calculation of, (D.) 26
Three-phase and contiuous current systems. By Addenbrooke, (D.) 623
Transmission of power, Hydro-electric, Antwerp, (D.) 25
Transmission plants
Bellegrade. By Preller, (D.) 690
California, Southern, Large scheme, (D.) 325
Chambley Rapids, Montreal, 231
Eichdorf, 10,000 volt, (D. R.) 265
Fresno, Cal. By Dutcher, (D.) 590
Hartford, Conn. By Robb, 224, 227*, 255*
Hungary, 12,000 volt continuous current, (D.) 424
Long-distance, (D.) 142
Niagara Falls—Buffalo, 724*. By White, 801
Recent, Description of. By McGhie (D.) 142, (D. R.) 207
Regla-Pachuca, Mex. By Henry, 351*, 379*
Riverside, Cal. By Layman, (D.) 690
Sacramento, First test, 10
Trenton Falls, N. Y., Proposed. By Dunlap, (D.) 590
12,000 volt continuous current, Hungary, (D.) 424
United States. By Washington, Jr., 311*
Utah, New, (D.) 690
Victoria Falls, Proposed, (D.) 142
Transmitters. (See Telephone transmitters.)
Trevelyan rockers. By Appleyard, (D.) 591
Trinity Church, New York, Celebration decorations, 579*
Triumph Electric Co., Generators, 31*, 785*
Trolley circuits, Safety device for. By Rowand, (D.) 625
Trolley cars, Ohio Brass Co., 820*
Trolley poles
Distance between poles. By Stark and Schwarz, (D.) 592
Protective device. By Sonneberg, (D.) 625
Trolley wire hanger, Ohio Brass Co., 459*, 515*
Trolley wires
Attachment for drawbridges, (D.) 207, 658
Diagonal system of support. By Henry, (D.) 480
Protection of overhead. By Chavannes, (D. R.) 361
Trucks, Motor, on Brooklyn Bridge, 123*
Tube Cleaner, Lagonda, 37*
Tubing, Manufacture by National Tube Works Co., 298
Tuerk fan motors, 338
Tunnel, Mt. Cenis, Electric traction, (D.) 690
Turbines
Electric plants in the U. S. By Washington, Jr., 311*
McCormick, 336*
"Success," 336*
Turntable, Locomotive, Milwaukee, (D. R.) 735

U

Underwood lamp guard, 483*
Units, Photometric. By Blondel, (D. R.) 29
Units of Power, Discussion of. By Preece, 308, (D.) 295
University of Wisconsin, Electro-chemical laboratory, (D.) 427
Upton midget enclosed arc lamp, 787*
Uranium. By Becquerel, (D.) 179, 455, 510; Moissan, (D.) 71
Discharge of electrified uranium in air. By Becqnerel, (D. R.) 660
Fluorescence of. By Spies, (D.) 426

V

Vacuum, Does it conduct electricity? By Trowbridge, (D.) 481
Vacuum tube lighting. By Edson, (D.) 368; Precht, (D.) 481
Valves, Lunkenheimer, 543*
Vessels, Electric propulsion of. By Heilmann, (D.) 266
Vetter multiple attachment plug, 339*
Vibrations. (See Electric waves.)
Vocal register, Developing by electricity. By King, (D.) 180
Voice, of singers, effect of Franklinization on. By Moutier and Ganier, (D. R.) 692
Voltage, loss in alternators. By Behn-Eschenberg, (D.) 24
Voltage regulartor, Belknap, 395?
Voltages for discharges from points. By Wesendonck, (D.) 426
Voltometer, copper. By Foerster, (D.) 816
Voltmeters
Hot wire, (D. R.) 739
Portable, Keystone, 567*
Voltmeters
Registering. By Chauvin and Arnoux, (D.) 539
New, (D.) 145
Von Stephen, Heinrich, Biographical sketch, (D. R.) 663

W

W. S. Hill Electric Co., Plant, 150*
Wagner Electric Mfg. Co., Description, (D. R.) 296
Wagon, Tower for lamp trimmers, 597*
Waldorf Hotel electric plant, 74, 148
Ward Leonard Co., Insulated outlet boxes, 148
Warren alternators, 429* 483*
Watches, Observations on magnetized. By Lewis, (D.) 180
Water
Electrolysis of. By Sokolow, (D.) 28; (D. R.) 145
At low voltage. By Tommasi, (D.) 852
Influence of a static charge on the surface tension of. By Nichols and Clark, (D.) 393
Water power
Development in U. S., 307, 316
Falls of St. Anthony, Development, 149, (D. R.) 207
Lucerne. By Guinand, (D.) 454
Minneapolis, Development, 149, (D. R.) 207
Nile cataract development, (D.) 658
Worcester, (D.) 392
Water power electric plants in the United States. By Washington, Jr., 307, 311*
Water purification, (D.) 738
Water wheel governor, Lombard, 315*
Water wheels
Efficiency. By Cazin, 66
Impulse, Experiments. By Hitchcock, 706* 768
Rechard turbine, 791*
Watt and the measurement of power. By Preece, (D.) 295
Wattmeters
Alternating current. Berlin, 459*
Calibrating. By Bedell, (D.) 482
Self-induction, Compensating the. By Danielson, (D. R.) 101
Wave motor, Wright, Test of, (D.) 391
Weiss & Bros. drill case, 568*
Welding, Electric. By Walker, (D. R.) 180
Welsbach mantles. Electric preparation of, (D.) 293 (D. R.) 29
Western Electric Co.
Fan motors, 514*
Knife switch, 35*
Western Union Telegraph Co. vs. Bell Telephone Co., 496
Westinghouse fan motors, 486
Westinghouse lamp patents, 226
Wharf, Electric haulage system, New Orleans. By Smith, 440, 443*
Wheatstone Bridge
Currents in the branches of. By Crehore and Squier, (D.) 512
Most sensitive arrangement of. By Child and Stewart, (D.) 692
Range and accuracy of measurements. By Smith, 364
White-Crosby insulators, 37*
Whitman & Couch interior telephones, 457*
Whitney portable testing set, 819*
Whittingham motor starter and quick-acting switch, 269*
Wilkinson mechanical stoker, 36*
Williams-Abbott telephone magneto bell, 744*
Willyoung & Co.
Cable testing set, 34*
Portable induction coil, 597*
Wimshurst machine
Observations with. By Negreanu, (D.) 482
Sectorless. By Keenan (D.) 662
Window reflector, Frink, 786*
Wines, Clarification of. By Reinke, (D.) 692
Wire-stretching device, Bunnell, 543*
Wires
Calculation of, for magnets. By Hanchett, 499
Calculation of alternating current circuits. By Allament. (D.) 659, 737
Calculation of cross-section. By Catani, (D.) 737
Impedance factor and fall of voltage in alternating circuits of large section. By Pinchou, (D.) 538, 659
Inductive drop on alternating current lines, (D.) 455
Manufacture of insulated. By Perrine, (D.) 143; Reed, (D. R.) 100
Resistance, Influence of vibration on. By Murani, (D. R.) 426
Sag of iron and bronze wires. By Dreisbach, (D.) 454
Stresses and magnetization. By Meyer, (D. R.) 241
Temperature; Variations in, when traversed by alternating current. By Guye, (D.) 660
Transmission of large currents. By Zahn, (D.) 538
Weight of copper, Calculation. By Norton, (D.) 851
Wiring. By Bochet, (D.) 510; Bonfante, (D.) 392 510
Calculation of, (D.) 592
Calculation of distribution wires for railways. By Pellissier, (D.) 564
German rules and regulations, (D. R.) 100, 538
Incandescent circuits. Drop in, (D.) 659
Inconsistencies in. By Gardner (D.) 326
Kosmo system (D.) 208
Line effects in alternating current transmission. By Raymond (D.) 851.
Long spans for aerial lines. By Pierard, (D) 208
N. Y. Stock Exchange, 243*

Wiring
Saving of copper in three-phase lines, (D.) 326
Standard rules, Committee report, 756
Switzerland rules and regulations, (D.) 455; By Szapiro, (D.) 510
Temporary, at Washington. By Bliss, (D.) 455
Three-phase interior, (D. R.) 26
Three-wire system
Economical cross-section. By Loppe, (D.) 454
Rise in voltage on. By Waskowsky, (D.) 425
Wiring
Tubing for interior work. By Bathurst, (D.) 851; Davis and Forbes, (D) 691; Zingler, (D.) 659, 690, 737
Wiring accessories, Siemens & Halske. By Hundhausen, (D.) 208, 266
Wiring table, Theory of. By Grier, (D. R.) 70
Wolfram. Reduction in the electric furnace. By Defacoz, (D. R.) 209
Worm gearing, Tests with Hindley form, (D.) 207
Wrench, Leg and pipe, Martini, 244*

Y

Yeast, Production by electricity, (D.) 540

Z

Zinc
Corrosion of plates. By Myhius and Funk, (D.) 28
Electrolytic. By Dieffenbach, (D. R.) 28
Zinc chlorides, Decomposition of. By Lorenz, (D.) 179

AUTHOR INDEX.

A

Anthony, W. A. Interior conduits, 225
Arnold, B. J. Moving field frames of direct connected units, 359

B

Barr, J. M., and Phillips, C. E. S. On the deflection of cathode rays, 289
Baxter, William, Jr., Controlling the speed of car motors, 477, 503, 535
Dissimilar action of similar machines, 259
The use of storage batteries in railway work, 62, 91
Berliner, E. The Berliner patent, 176
Bijur, Joseph. Transformer regulation, 416
Blondel, A. E. Luminous efficiency of the alternating-current arc, 232*, 258
Bohm, L. K. An electro-pyrometer, 366*
Brown, H. P. Some recent developments in copper manufacture, 331

C

Carhart, H. S. Heating of magnet coils, 11
Professor Galileo Ferraris, 284*
Cazin, F. M. F. Impulse water wheel experiments, 768
Cochrane, Haywood and Swartout, E. J. Requirements of high speed and heavy electric traction 553*
Crehore, A. C., and Squier, G. O. The synchronograph, 585
Crocker, F. B. Principles of electrical distribution, 21*, 60*, 93*, 125*, 167*, 197*, 236, 261

D

Daft, Leo. Early electric motors of the New York elevated railway, 452
Davis, A. G. An induction booster, 390
Direct currents from alternating, 54
The inventor and the technical journal, 688
Doane, F. H. New armature winding diagram, 834*
Dunbar, F. W. Interests of the public in the telephone situation, 18, 58
Dunstan, A. St. C.; Rice, M. E., and Kraus, C. A. Broadening of the sodium lines by intense magnetic fields, 556*

E

Elliott, E. L. Distribution and diffusion of light, 127*

F

Fessenden, R. A. Prospective development of ether theories, 9, 176
Qualitative mathematics, 206
Fischer-Hinnen. The design of direct current machines with reference to sparking, 336, 419, 446
Francisco, M. J. Municipal ownership, 707
Frost, E. F. Berliner microphone case, 281
Probable decision in the Berliner case, 497

G

Goldsborough, W. E. Economy in the design of electro-magnets, 196
Guigon, A. B. Independent telephone companies, 810
Gunton, H. C., and Lomas, Harold. Electric lighting in Norwich, England, 471*
Guthe, Dr. K. E. Influence of heat treatment upon the magnetic properties of

H

hardened steel, 409
Hale, R. S. Charging for electrical energy, 478
Hale, W. H. The two great science associations, 282
Hanchett, G. T. Calculation of wires for magnets, 499
Manipulation of Roentgen-ray apparatus, 377*
Profitable day load in alternate current systems, 525, 589
Some dielectrics and their insulating properties, 193*
Hansard, A. G. Relation between the speed and efficiency of a dynamo, 203
Henry, G. J. The Regla-Pachuca power transmission, 351*, 379*
Hering, H. S. Portable autographic recording meter, 617*
Herrick, A. B. Central station switchboard construction, 831
Hitchcock, E. A. Impulse water-wheel experiments, 706
Houston, E. J., & Kennelly, A. E. Alternating-current machinery, 20*, 94, 166*, 234*, 285*, 354, 473, 526*, 621, 686, 806
Insulating medium surrounding a conductor the real path of its current, 421
Measurement of the insulation resistance of continuous current three-wire systems while at work, 309
Howell, J. B. Radiating surfaces of lamp filaments, 53
Howell, J. W. High and low voltage incandescent lamp, 705
Hunter, R. M. The enclosed arc lamp, 291

J

Jackson, D. C. Conductor resistance met by alternating currents, 90
Maximum output of alternators, 378
Jenness, E. J. Decorative lighting, 64
Johnstone, W. H. First electric railway passenger, 589*
Jones, F. W. Progress in American telegraphy, 16

K

Kalischer. New effect of magnetism on light, 677
Kelly, J. F. Polyphase transmission of power, 98
Kennelly. (See Houston.)
King, F. W. N. Electric light plant in Melbourne, Aus., 5*
Kirkegaard, Georg. American exportation of electrical machinery, 226
Kraus, C. A. (See Dunstan.)

L

Lawrence, R. R. New method of operating an induction coil, 324
Laws, F. A. On a new method of delicate suspension, 86*
Lomas, Harold and Gunton, H. C. Electric lighting in Norwich, England, 471*

M

M'Laren, G. S. Insurance as affected by electrical construction, 140
Marks, L. B. The enclosed arc light, 130*, 174*, 198*, 712, 837
Maver, William, Jr. Electric lighting subways, 715*, 766*, 803*
Progress of electrical subway work, 163*

N

Norton, C. L. New method of operating an induction coil, 324

P

Patten, F. J. Frequency transformation, 758
The telephone repeater, 647*, 681*, 710*
Perrine, F. A. C. Reasonable method of rating and testing safety fuses, 161
Perry, N. W. Gaseous fuel as a means of cheapening electricity, 201
Phillips, C. E. S., and Barr, J. M. On the deflection of cathode rays, 289
Porter, F. B. Testing the field coils of a street railway motor without instruments, 498
Testing the resistance of a field coil when instruments are not available, 350

R

Reed, C. J. An expiring patent on the Jacques battery, 141
Theories of the Jacques cell, 13
Rice, M. E. (See Dunstan.)
Robb, W. L. Long-distance transmission of power at Hartford, 227*, 255*

S

Sayen, H. L. Roentgen ray tube with automatically adjustable vacuum, 578*
Schieble, Albert. The inventor and the technical journal, 641, 768
Smith, I. B. Range and accuracy of Wheatstone bridge measurements, 364
Smith, Nelson. Electric haulage system of New Orleans & Western Railroad Co., New Orleans, 443*
Steinmetz, C. P. Parallel operation of alternators, 8
Stine, W. M. Roentgen rays as a medical aid, 10
Safety devices for electrical circuits, 138
Sutton, G. W. Validity of the Berliner patent, 716*
Swartout, E. J., and Cochrane, Hayward. Requirements of high speed and heavy electric traction, 553*
Swinton, A. A. C. Adjustable X-ray focus tubes, 577*

T

Taylor, R. S. The Berliner patent and the government suit, 842
Terry, F. S. Incandescent lamps, 172
Thomas, J. M. Object of the telephone convention, 811
The independent telephone movement, 340
Thomson, Elihu. Fuel energy into electrical energy, 4
Recent progress in arc lighting, 762
Speculation regarding the cause of Roentgen rays, 829
Tommasi, D. Reply to Mr. C. T. Reed, relative to the carbon electrode battery, 89
Trowbridge, John. The high tension accumulator of the Jefferson physical laboratory of Harvard University, 15
Turnbull, W. R. Action of fluorescent substance on the cathode and X-rays, 688

Z

Washington, B. C., Jr. Water power electric plants in the United States, 311*
White, J. G. Niagara power transmission line, 801
Willyoung, E. G. Dielectrics and their insulating properties, 264
Wilmerding, C. H. Profitable day load for a large central station, 714
Wirt, H. C. Protective devices for transformers, 133*
Wolcott, Townsend. Qualitative mathematics, 141, 238
Woodbridge, J. E. Connections of railway generators, 502
Rotary transformers, 415
Woodward, F. L. Effects of Roentgen rays upon a beam of light, 829

W

Zeenan, P. Optics and the theory of ions, 555